AMERICAN AGRICULTURIST

FOR THE

Farm, Garden, and Household.

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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THE MUSMON OR WILD SHEEP OF EUROPE—(*Ovis Musimon*).—*Drawn and Engraved for the American Agriculturist.*

The origin of our domesticated sheep will probably ever remain a mystery. From which of the known races of wild sheep it has been derived, is a matter of dispute, or at least of difference, amongst naturalists. Indeed, it is and has been a question which of these wild races is really the aboriginal one, or whether there was but one or more than one. Whoever has carefully studied the subject, and is without prejudice, or does not seek to support a foregone conclusion, would probably consider the different wild sheep to have been derived from one aboriginal race, and the different domesticated varieties that have a very ancient history, to have sprung from the more ancient wild races. Thus we might consider with reason, that the Argali or Asiatic Mountain Sheep, was the progenitor of our Rocky Mountain Sheep, and of the domesticated Asiatic races, as well as of the European wild mountain sheep the Musmon, the subject of the above illustration; and this last in turn may reasonably be supposed to have been the ancestor of the very different Spanish Merino, and consequently of our own American Merino. The gradual evolution of an improved breed from a very coarse ancestry, and the wonderful refinement that is possible in course of even a few years of careful breeding, go to explain very satisfactorily many otherwise startling differences in the structure, habits, and other general characteristics of an animal. It is, therefore, far from difficult to account for the widely different characters of our Merino and this ancient wild race, which is, doubtless, at this time nearly, if not precisely, like what it was two or three thousand years ago. The Musmon inhabits the mountains of Southern Europe, and of the Islands of Crete, Cyprus, Sardinia, and Corsica. It formerly abounded in Spain, and is supposed still to exist in the mountains of some of the wilder portions of that country. The male has horns two feet in length, but the female is often hornless. These animals gather in flocks of some hundreds, except at the breeding season, when the large flocks separate into small ones, consisting of one male and a few females. They have been known to breed from the domestic sheep, and the progeny is fertile. Such cross breeding was common in the time of Pliny, or over 2,000 years ago, and the produce was mentioned by this writer as being termed Umbri. The coat of this sheep is outwardly a brownish hair, covering an undercoat of fine, gray wool, which is short, but full of spirals, and very closely serrated upon the edges. It is interesting to consider if the Spanish Merino inherits its "fine, short wool, full of spirals, and closely serrated," from this original race, which inhabited the country where the former first became known to the Romans, who carefully bred and greatly improved it.

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Taking Out Stumps.—"W. A.," Leemorn, Mo. It will certainly pay to take the stumps out of a field, so that a mower can be used. The gain in time and labor made would make it worth while to spend a dollar for each stump, unless they are very closely set. With giant powder, or even common powder, a stump may be blown out for less than this sum.

Galvanic Chains, Belts, and other electrical appliances. We have numerous letters concerning various contrivances for applying electricity as a remedy, and we can only give a general answer. These things are not sent to us for examination, and we have no special knowledge of the different kinds now offered Electricity in some of its forms has been found to be a useful remedial agent. Whether it is likely to be useful in any particular case, we can not say. We do not practise medicine, and if we did, we should not give advice without seeing the patient. Electricity being an agent about which people in general know but little, is one of the things made use of by quacks. Some of the pretended electrial appliances we have seen, are thoroughly unscientific in construction, and can have no more medicinal effect when applied to the body than a belt or pad of leather, or other inert substance.

Calendar for January.

Day of Month.	Day of Week.	Boston, N'Eng land, N. York State, Michigan, Wisconsin, Iowa, and Oregon. Sun rises.	Sun sets.	Mo'n rises.	N. Y. City, Ct., Philadelphia, New Jersey, Penn., Ohio, Indiana, and Illinois. Sun rises.	Sun sets.	Mo'n rises.	Washington, Maryland, Virginia, Kentucky, Missouri, and California. Sun rises.	Sun sets.	Mo'n rises.
		H. M	H. M	H. M.	H. M	H. M	H. M.	H. M	H. M	H. M.
1	T	7 30	4 38	6 4	7 25	4 44	5 58	7 19	4 49	5 50
2	W	7 30	4 39	7 5	7 25	4 44	6 58	7 19	4 50	6 51
3	T	7 30	4 40	sets	7 25	4 45	sets	7 19	4 51	sets.
4	F	7 30	4 41	5 38	7 25	4 46	5 44	7 19	4 51	5 50
5	S	7 30	4 42	6 43	7 25	4 47	6 48	7 19	4 52	6 53
6	S	7 30	4 43	7 46	7 25	4 48	7 50	7 19	4 53	7 53
7	M	7 30	4 44	8 48	7 25	4 49	8 50	7 19	4 54	8 53
8	T	7 29	4 45	9 49	7 24	4 50	9 50	7 19	4 55	9 50
9	W	7 29	4 46	10 50	7 24	4 51	10 49	7 19	4 56	10 49
10	T	7 29	4 47	11 51	7 24	4 52	11 50	7 19	4 57	11 50
11	F	7 29	4 48	morn	7 24	4 53	morn	7 19	4 58	morn
12	S	7 28	4 49	0 55	7 23	4 54	0 52	7 18	4 59	0 49
13	S	7 28	4 50	2 2	7 23	4 55	1 57	7 18	5	1 54
14	M	7 28	4 52	3 12	7 23	4 56	3 7	7 18	5 1	3 1
15	T	7 27	4 53	4 24	7 22	4 57	4 17	7 17	5 2	4 11
16	W	7 27	4 54	5 34	7 22	4 59	5 26	7 17	5 3	5 19
17	T	7 26	4 55	6 38	7 21	5 0	6 28	7 17	5 4	6 22
18	F	7 25	4 56	rises	7 21	5 1	rises	7 16	5 6	rises
19	S	7 25	4 58	5 49	7 20	5 2	5 54	7 16	5 7	5 59
20	S	7 24	4 59	7 12	7 20	5 3	7 13	7 15	5 8	7 16
21	M	7 23	5 0	8 31	7 19	5 4	8 30	7 15	5 9	8 32
22	T	7 23	5 1	9 45	7 19	5 6	9 45	7 14	5 10	9 45
23	W	7 22	5 3	11 1	7 18	5 7	10 59	7 13	5 11	10 58
24	T	7 21	5 4	morn	7 17	5 8	morn	7 13	5 12	morn
25	F	7 20	5 5	0 17	7 16	5 9	0 14	7 12	5 13	0 11
26	S	7 20	5 6	1 52	7 15	5 10	1 27	7 11	5 15	1 23
27	S	7 19	5 8	2 46	7 15	5 12	2 41	7 11	5 16	2 35
28	M	7 18	5 9	3 57	7 14	5 13	3 59	7 10	5 17	3 43
29	T	7 17	5 10	5 0	7 13	5 14	4 52	7 9	5 18	4 44
30	W	7 16	5 11	5 53	7 11	5 15	5 46	7 8	5 19	5 38
31	T	7 15	5 13	6 36	7 11	5 17	6 29	7 7	5 20	6 22

PHASES OF THE MOON.

MOON.	D.	BOSTON. H. M.	N. YORK. H. M.	WASH'N. H. M.	CHA'STON H. M.	CHICAGO. H. M.
New M'n	3	9 19 mo.	9 7 mo.	8 55 mo	8 43 mo.	8 18 mo.
1st Quart	11	2 3 ev.	1 51 ev.	1 39 ev.	1 27 ev.	0 57 ev.
Full M'n	18	7 27 ev.	7 15 ev.	7 3 ev.	6 51 ev.	6 21 ev.
3d Quart.	25	11 6 mo.	10 54 mo.	10 42 mo	10 30 mo.	10 0 mo.

AMERICAN AGRICULTURIST.

NEW YORK, JANUARY, 1878.

A new year now begins which promises to be one of eventful interest to the agriculturist and all others engaged in productive industry. For many years the nation has been undergoing a severe process of liquidating debts, casting off fictitious ideas of values and, to use a common expression, "coming down to hard pan." At the outset of this revulsion, which was inevitable after the previous years of an inflated and deceptive prosperity, farmers were the first to suffer, and the most seriously afflicted. Nearly every one was in debt for borrowed money or for property, machinery, implements, or stock. Prices of produce first fell, but the cost of all things needed for the farm and household, together with the price of labor, kept up, and farmers had more than their share of adversity. Along with the business troubles, came unfavorable seasons, fatal disease among stock, and the "hateful grasshopper," with other pests. But out of adversity grew an improved condition which now appears to have placed the farmer beyond the reach of trouble, and to promise him in the future a lengthened season of prosperity, should no untoward accident occur. After the disagreeable experiences of the past years we now have good reason for congratulation. We are emboldened to act once more with the usual native enterprise of the American people. Circumstances of all kinds favor this. The bottom has been reached. For the past 20 years the prices of many things which the farmer purchases have not been lower than now. Labor is lower than ever before. Hundreds of thousands of laborers are waiting for work, yet there is work for every one. What a change for the better would it be if all this labor could be turned at once to productive account! Considering the vast amount of work that is waiting to be done, the necessary improvements of roads, fields, buildings, tools, implements, and other things upon which the prosperity of agriculture depend; the vast field in fact which is opened up by the absolute need for the best and highest culture of our soil, and the most profitable exercise of the farmer's art, one is amazed as he ponders over the results that might and would be attained were all this labor employed and all these improvements set in operation and made. What fruitful fields, where now are barren wastes or worthless weeds; what wealth, where now is poverty; what populous villages, where now are wretched hamlets; what comfort and enjoyment where now misery and destitution prevail. Here is the labor and there is the work to be done; what keeps these apart, and hinders the desirable result? Certainly every farmer in the land can do something at this time to change all this, and hasten the looked for for prosperity.

Hints for Work.

Planting and Sowing may be done in many of the Southern States. Where the season admits of it, potatoes may be planted this month, and will ripen in June. It is only necessary to cover the sets deeper than in summer planting, and if a frost is probable, draw earth over the young plants with the hoe. Oats sown this month will do as well in most cases as those sown in the fall.

The Hessian Fly is active in the South at this season, while dormant in the colder North. Anything that will disturb the larva in its operations will be beneficial; as will also any fertilizing application that will strengthen the plants. Rolling the wheat, sowing 5 bushels of salt, or 50 bushels of unleached wood ashes, or 10 bushels of soot per acre, have all been found of use in destroying the insects and in stimulating the growth of the wheat.

Breaking Up the Land, for the main crops of cotton and corn, should be begun this month. Secure laborers for the year. The planter can now select the best help, while later he must take just what he can get. The best laborers don't wait long to be hired, and those who look out first are best served.

Fences are to be Repaired or made, and much draining may be done, both in the North and South.

Hired Labor is Cheap; for a few dollars, and by exercising judgment, one can now get more work done than he could for many years past. The laborer who stands idle when he may earn 50 cents, is unwise; a little is better than nothing.

What May be Done?—Stone may be got out and hauled into heaps where it may be wanted for sale or for use. A well may be dug in the barn yard. Posts and rails may be got out in the rough, hauled to a convenient spot, and piled up to dry. Slabs from a saw-mill make excellent fence posts, and can usually be purchased very cheaply, and these may be drawn home. Springs may be cleaned out and walled up. Rocks may be undermined and toppled into large holes and buried. To a willing worker, there never comes a time when there is nothing to be done; and much may be done now to prepare for the busier period which will soon be at hand.

Wintering Horses.—Working horses, 25 years old, are very rare, and yet at this age a horse may be vigorous and useful. The duration of a horse's life is 30 years, if he is well cared for, and in his old age moderate work may be expected from him. A large proportion of horses are ruined before they are 5 years old by over work, improper feeding, neglect, and abuse. Neglect and improper feeding find more victims than over-work, for if a horse in his prime is properly fed and cared for, he can scarcely be hurt by steady work.

Feed Should be Given regularly as to time and quantity. A horse has a comparatively small stomach. Five pounds of cut hay, and three quarts of ground feed, should make a full feed for a large horse. Horses that are worked on the road at more than a walking gait, should have the hay reduced to 3 pounds and have 4 quarts of the feed. If the feed is moistened with water, give no drink until an hour after feeding, and none immediately before.

Good Grooming is necessary to good digestion and health. The functions of the skin are very important. The skin is an excretory organ as well as one which affords covering and protection to the muscular tissues. Cleanliness of the skin is as necessary for the health of a horse as for that of a man. The skin exfoliates or throws off in scales the used up portion, and this dusty matter should

be brushed out of the coat. The irritation by the brushing stimulates the skin, and assists this healthful action; but the irritation should not be too severe. A moderately hard brush is preferable to a hard, sharp curry-comb.

Provide a Card for the Cows, and use it at least twice a week; remove all adhering filth every morning, and keep the feet clean; else sores will very probably occur between the hoofs.

Incoming Cows, more especially those that are high-bred and have been well fed, should be judiciously starved for two or three weeks previous to calving, and for a week after it. Feed such cows only dry hay, or partly hay and partly cut straw, with a little bran and a handful of salt. The milking of an incoming cow just previous to her calving, should be avoided, as tending to unduly stimulate the organs and produce the very trouble that is sought to be prevented.

Calves and Yearlings, and cows and oxen as well, when infested with lice, should be freed at once by rubbing the skin with a mixture of sweet oil and kerosene in equal parts. During the winter young animals should be kept growing by means of nutritious food, good shelter, and cleanliness.

Separate Stock into different grades; or feed these at different times if separate yards are not provided. Strife and worry at feeding times should be prevented by these or some other means.

Sheep require a plenty of fresh air. Their warm coat protects them from the cold, and if they have a dry yard, they are better out of doors in fine weather than in a close shed.

Water should be provided in abundance for all the stock, and that drawn from a well is preferable to any other. It is not only purer, but—what is of importance—it is comparatively warm and does not chill the animals. No animal should be compelled to eat snow for drink if it is expected to thrive.

A Pump that will not Freeze, should be placed in every barn-yard. Blunt's non-freezing, out-door, iron, universal pump, surpasses any other we know of for this use or for the house yard. It may be placed over a cistern or a well; however deep it may be, it cannot freeze, and it has an effective device for aërating the well. It can be used as a force pump, and by means of a hose, water may be carried into any of the stables, yards, or pens.

Swine intended for pork should by this time have been fattened and disposed of. Store pigs, if well-fed and housed, will make good growth all through the winter. Nothing helps them to thrive more than slightly warm feed given often. Growing animals should not be gorged with food. A light meal, given four times a day, is better than two heavier ones. It is very easy to over-feed young pigs, and cause indigestion and stoppage of growth.

Grade Pigs are preferable to any pure bred ones for the farmer. As a rule, it will be found a mistake for a farmer to keep pure bred animals except males to produce grades. High-bred animals are nearly always smaller and more finely organized than their grade progeny. Their greatest value consists in producing an improved progeny from our common stock. This is large in size, and in every way more valuable for the market or for home use than the pure bred sire would have been. In no kind of stock is this fact more manifest than with swine. No matter what kind of breed of pigs is kept, this rule will hold good.

Brood Sows, coupled this month, will have pigs in May, which is an excellent season for the pigs. The weather being then warm, and the clover in fine condition for pasturing, the young pigs will make a rapid growth, and will soon surpass those farrowed two or three months earlier, unless cared for in a better manner than is usual. By all means, procure a pure bred boar.

Poultry.—The egg-basket can only be filled now, by giving warm feed and providing a warm, dry house. Clean out the roosting places every week.

Disinfectants.—Deodorizers are not always disinfectants, but nevertheless as many of these substances absorb or neutralize what would—if neglected—soon become infectious matter, they may be practically classed as disinfectants, and should be used as such. Those most easily procured, and the most useful, are ground gypsum, sulphate of iron, (copperas), and sulphuric acid, largely diluted. Any one of these *should* be used in every manure cellar, and is to be recommended for stables, pig-pens, cow-sheds, and poultry-houses. The gypsum may be scattered freely about the floors, or thrown upon the manure; the copperas should be dissolved in water, at the rate of 10 pounds to the barrel of the latter; the sulphuric acid mixed with water in the same proportion, and the liquid scattered over the floors or upon the manure.

Leisure Time should be usefully employed. The winter is the time for study and reading. This is work of the most useful and profitable kind. Many of the most intelligent farmers set apart a certain portion of their yearly income for the purchase of books and papers, and certainly no money can be put to a better purpose. In chosing these, the necessities of the mother and daughters should not be neglected, but should be provided for. The success of the farm largely, and the comfort of the household almost entirely, depend upon women's work, and the women should be provided with means for doing their work most effectively.

Notes on Orchard and Garden Work.

In whatever occupation one may be engaged, he is more ready at the beginning of a year, than at any other time, to look forward and lay plans for the future, and also to receive the suggestions of others. It is a good place here, at the beginning of the year, to answer numerous letters that have been written, and to anticipate others that no doubt are in contemplation, in reference to horticulture as a business. The horticultural novels of a few years ago, of which "10 Acres Enough" was the forerunner and the type, have done a world of harm, by conveying the idea that one, brought up to a city life, or to some mechanical trade, can, with great ease, drop into the cultivation of fruits, vegetables, or flowers, and at once reap large profits in the easiest and pleasantest manner possible. Such teachings are wrong, because they are false. If there is any money to be made out of *cultivating the earth*, whether the crop be wheat or strawberries, Indian corn or cauliflowers, without *work*, hard work, and a plenty of it, we have never happened to learn what the crop is, or where it can be raised. That orcharding small fruit culture, market-gardening, or raising cut-flowers may be made, in many localities, a profitable business, we are fully persuaded, but each one of these requires not only physical labor, and much of it hard work, but one must bring to it, if he would succeed, just that mental activity, and that care and forethought which are needed for success in any other business. If there is any "royal road to riches," it does not lie through an orchard, a garden, or a greenhouse. We would say nothing to deter any one from undertaking any branch of horticulture as a business, but we would dispel the notion that those who have not sufficient energy, skill, application, and tact, to carry on other kinds of business, are any more likely to succeed in these.

"Manuring with Brains" has passed into a proverb, and, like most proverbs, conveys an important truth. The present is the season in which, of all others, the cultivator can best apply "brain manure." Those of us who have kept the run of horticultural and agricultural journalism, and literature, for the past quarter of a century, have seen a marked change in one respect. We rarely hear sneers now at "book-gardeners" and "book-farmers." Experience of real value is not thought to be worth any the less, if recorded in the type of a journal, and if the same matter is presented in the form of a book, if likely to be useful, it meets with ready purchasers, even from those formerly opposed to "book-farming."

As editors, it becomes a part of our duty, if not to thoroughly read, at least to know something of the works published both at home and abroad, and leaving out of question some miserable pieces of job work, where matter is thrown together for the sake of "making" a book—we have rarely seen a book written by any one who felt that he had something to say, on any branch of horticulture, that did not contain some idea that was worth, to those concerned in the specialty, all the cost of the book. We look upon books, to those engaged in orcharding, in fruit growing of any kind, in vegetable or flower culture, as quite as essential implements, as much tools to be of use in their occupation, as spades, rakes, or other garden tools.

The special works will be mentioned in their proper places, but every cultivator, whether he has to do with acres in field crops, or pints of earth in flower-pots, is engaged with essentially the same materials; the plant, the soil, the air, and water. *Every one* should have an intelligent idea of the mutual relations of these. He should know what a plant is, how it grows, what helps its growth; what is in the soil, and what these constituents, the air and the water, have to do with the plant. We can not do a better service to every intelligent gardener, orchardist, or other cultivator, who would understand the first principles, which underlie all the rest, than to commend to him, whether young or old, a careful study of "How Crops Grow," and "How Crops Feed," by Prof. S. W. Johnson. Not only for study—and whoever masters these works the coming winter will have made a great step towards a "liberal education" in his calling—but as works of reference, they will be found invaluable.

But to the cultivator, in whatever branch, there is another kind of literature to which we would commend him. Works easily to be procured, and, as a rule, worthy of careful consideration—the Catalogues of those dealers in articles belonging to each line of culture, and of those who furnish needed accessories. Do you propose to water your garden? Study the catalogues of the Steam and Hand Pump-makers, or those who furnish Water Rams. Does the stock of tools need replenishing? One can not afford to ignore the improvements of even a single year, and the drills, cultivators, harrows, and improved implements generally, may be a useful—as it will surely be an interesting study. So with fertilizers, the literature of which should be carefully considered. If one is to plant trees, vines, or other fruit-bearing plants; if he is to sow seeds, if he is to be in the fashion with flowers as a business, or if he is to plant, sow, or cultivate anything, whether for profit or for amusement, on a large or a small scale, he will find the catalogues, each in its way, of the greatest help.

"Line upon line, and precept upon precept," is as necessary in horticultural as in higher teachings, and though these Notes are always written afresh, without reference to what has been said in former years, we should be neglectful of our duty did we not repeat some things which have already been said, more than once, and which will be said again and again, by whoever may speak through these columns to his fellow workers.

Each year's experience shows that the only trustworthy label, is *none at all*. That is, every tree, vine, or permanent plant, should be so recorded by its position, that though labels may be lost, though the memory may fail, and what is quite as important in this changing world, though our place may come into the hands of another, the names of each tree or plant should be so recorded that one can readily refer to it himself, and that another will have no difficulty in finding the name. It is a very simple matter; and for safety, there should be a permanent record, from which an abstract may be transferred to a small book, to be carried in the pocket. Ours runs something thus:—"Road from barn east to avenue." "First row south, beginning east end of row;" 2, Beurre d'Anjou; 4, Duchesse d'Anjouleme; 1, Belle Lucrative, and so on. Then second row south, is recorded in a similar manner. By the use of a few permanent landmarks, all the trees are readily recorded. Strawberries with us, run in strips across the garden, and to prevent running together, are 10, 20, or more feet apart, wherever there is a convenient place. A record of the rows, counting from the barn road, tells the story. The vineyard is a square block, but it is recorded in the same manner, by points of the compass. This matter of record is one of so much im-

portance, as well as convenience, that we are warranted in enforcing it upon every cultivator.

Another repetition, is the importance of ordering early, whatever is to be bought and will be needed, as soon as the season opens, whether trees, plants, seeds, or implements. It is better to order trees in March than in May, but a great deal better to order in January than in March. We have almost no spring. It is generally a jump from winter to summer. In every well-regulated nursery, seed-store, or implement factory, orders are entered by the date on which they are received, and filled accordingly. If trees are ordered now, they will be among the first taken up and sent; they will not start to grow in the nursery rows, or heat if long in transit, and there are similar advantages to be gained in ordering early from dealers in other articles.

In these suggestions at the beginning of the year, we have in mind the fact that whoever starts well ahead of the season will be likely to keep ahead of it. The market gardeners, when they would speak of one who is slack, and always just a little behind his work, say "he lets his *pussley* get ahead of him." This has a wider application than in the market garden, and in leaving these General Notes to give some brief special ones in the different departments, we wish our friends, in every branch of horticulture, a successful year—and may none of them find that their "pussley" is getting the better of them.

Orchard and Nursery.

"*Brain Manure.*"—The orchardist, quite as much as any other tiller of the soil, needs that fundamental knowledge to which we have referred above, and which we have stated is no where so well furnished in any language as in Prof. Johnson's "How Crops Grow," and "How Crops Feed." He also needs works which shall instruct him in the manipulations of his occupation, and we do not know of any one work which is so full of just the information he needs, to aid him starting anew, or to keep at hand for daily reference, as

"*The Fruit Garden,*" by Patrick Barry.—We have often thought that the title was unfortunate, as it hardly gives an idea of the scope of the work. In the present subdivision of horticultural pursuits, we apply the name "Fruit Garden," to a ground more especially devoted to small fruits, while this is by far the most comprehensive work on

Fruit Culture in General, that we know of. There are some French works that compare favorably with it in some respects, but we know of no English work that is at all its equal. It begins at the beginning, and teaches in the plainest language, and with abundant illustrations, every step from raising the stock, budding or grafting it, planting it in the orchard, caring for and pruning it, to gathering the fruit, and besides this it gives a list, with brief descriptions, of the most generally useful varieties of each fruit. While of equal value throughout, that which distinguishes this work from all others, is its minute directions for the details of

Nursery Practice.—It is no disparagement to other establishments, to say that the nursery of Ellwanger & Barry is the largest in the country, and one of the oldest. In his "Fruit Garden," while Mr. Barry gives the management and principles which have been found successful in practice on the large scale, required in a commercial establishment, he does not forget the wants of the amateur. One of the best features of the work is the freedom with which, what some smaller men regard as "trade secrets," are told, and one feels that nothing is withheld, for fear some one else may know as much as the author. Next in general utility we place

"*The American Fruit Culturist,*" by John J. Thomas, to which much of what we have said about Mr. Barry's work will apply. Though it is not so full in nursery details, its larger descriptive list of fruits may make it desirable to those who do not care so much for growing the trees, as they do for them after they come from the nursery, and their future management and culture. The work by Doct. John A. Warder, entitled

"*American Pomology,*" which has not, unfortunately, gone beyond apples; it is rather unfortunate also in its title, as the volume is largely devoted to the nursery details for which we commended Mr. Barry's work. It is the only work that we know of which gives the rapid, labor-saving management of the Western nurseries, and its chapters on general operations are the results of the observations of one whose opportunities have been abundant, and of a long and successful experience. The peculiarly Western varieties of apples, are described in full, as are all others in general cultivation.

Downing's "Fruits and Fruit Trees of America."—Many will wonder why this was not placed first upon the list. As a treatise on pomology, a record and descriptive account of all the fruits in cultivation, it is invaluable, but other works are better suited to the general farmer, and the orchardist whose operations are limited....Those who devote themselves to the cultivation of some particular fruit, should have the works devoted to it. Warder's has been noticed as a special treatise on apples.

Peach Culture has methods and requirements unlike those of ordinary orchards, and these are given in Fulton's "Peach Culturist," in which the management of the great peach orchards in Delaware and Maryland is given in full detail.

"*Pear Culture for Profit*" is the title of another valuable special work, by P. T. Quinn, who, having cultivated pears largely, and made them profitable, tells how he did it, and the kinds he grows.

Orchards Old and Young, in the Northern States, need such care as is mentioned in last month's Notes. ...Protect trees, especially young ones, from intruders of all kinds....Trample the snow around young trees to prevent mice from working at them....Smear the trunks, especially of young trees, with blood, or rub them with bloody flesh, to keep off rabbits....Cut away clusters of eggs of the Tent Caterpillar, whenever seen near the ends of the twigs. These are the chief points, and it is necessary to observe them all through the winter. ....Cions may be cut, labeled, and stored in damp saw-dust, or sand....Cart manure to the orchard.

In the Southern States manure and shallow plowing the orchard may be done. In many localities this is the most favorable month for planting, pruning, and other spring work.

Those who have the volume for last year (1877) will find in the Notes for January suggestions about varieties that will be of aid to the inexperienced.

Fruit Garden.

It may be necessary to say to our new readers that under this head we place what are known as "small fruits," including grapes, and the dwarf forms of the larger fruits, such as the amateur grows in the garden rather than in the orchard. For the cultivator of these, there is a number of special works, while most of the

General Works, mentioned under "Orchard," include the small fruits also. The "Fruit Garden," by Barry; "American Fruit Culturist," by Thomas, and Downing's "Fruits and Fruit Trees," all treat of small fruits in a satisfactory manner. Of general treatises on fruits of this class:

"*The Small Fruit Culturist,*" by A. S. Fuller, is the chief and most complete. Its excellence is attested by its large sale, and its translation into his own language, by one of the most eminent of German pomologists—Dr. Lucas.

"*Manual of the Culture of Small Fruits,*" by E. P. Roe, is a brief compendium, giving the author's experience and methods, and is eminently sensible and useful. In the way of special treatises,

Works on the Grape Vine are the most numerous. "The Grape Culturist," by A. S. Fuller; "Mohr on the Grape Vine," Chorlton's "Grape Growers Guide," and "My Vineyard at Lakeview," are the leading works.

Strawberry Culture is included in Fuller's "Small Fruit Culturist," and he has besides a special work, "The Illustrated Strawberry Culturist." "Strawberry Culture," by Merrick, is another special and useful work, giving New England methods.

Cranberries belong among the small fruits, but their culture can only be profitable in certain localities, and is so peculiar as to require a special work. "The Cranburry Culturist," by J. J. White, gives every needed detail, and is a model of excellence and completeness in the way of a monograph.

Dwarf Fruits.—Apples, pears, and other fruits, which usually grow upon large trees, may be dwarfed, and trained in the pyramid or bush form, only a few feet high. They give, for their size, large crops of the finest fruit, and the amateur, whose grounds are small, will find their culture full of interest. The works on general fruit culture, already mentioned, especially Barry's "Fruit Garden" treats of these, while "The Miniature Fruit Garden," by Thomas Rivers (England) is especially devoted to dwarf trees.

Work in the Fruit Garden was sufficiently indicated last month. If the strawberries have not been covered, do it at once. Draw manure to where it will be wanted. Take advantage of mild spells to finish up pruning of grape vines, currants, etc.

In the Southern States soil may be prepared and planting may be done in many localities.

Kitchen and Market Garden.

In no kind of cultivation is success so dependent upon the abundant manuring of the soil as here, and in no other department does "Manuring with Brains" tell better. The appearance of

"*Gardening for Profit,*" by Peter Henderson, was an important event in garden literature. It was the first work that told the story of those who raised vegetables for profit. It told the *whole story* without any mental reservations, and its success and its usefulness have been unequalled. While written to give the methods followed by market gardeners, it is a work that every private gardener should have.

"*Money in the Garden,*" by P. T. Quinn, and "*Farm Gardening and Seed Growing,*" by F. Brill, while they cover similar ground, are in many respects quite unlike "Gardening for Profit," and both valuable to the cultivator.

"*Gardening for the South,*" by W. N. White, has its scope indicated in its title, though its usefulness is not limited to the Southern States. A number of garden crops are often cultivated on the large scale, and for those who would grow these, works on

Special Crops are prepared. Among the prominent works of this kind are, "Onions, by 17 Practical Growers;" "Onion Raising," by Jas. J. H. Gregory;" also works by Mr. Gregory on Squashes, on Cabbages, and on Carrots, and other roots. There is a special work on "Potato Culture," by Compton. These and other small treatises are of great value to any who propose to undertake the special cultures of which they treat.

"*The Vegetables of America,*" by Fearing Burr, is an instructive history of the origin and varieties of the various vegetables, including the rarer kinds, and a valuable work of reference.

Work in the Garden consists in looking after the stored crops, that no injury may come from freezing, or from heating on account of too close covering....Cold-frames need daily care; give air on all but the very coldest days, and when the temperature is up to 30°, or above, remove the sashes in part or entirely....Manure heaps must not overheat, nor get so much chilled that fermentation will not go on; turn over the pile when too hot, and give water if at all dry.

In the Southern States hot-beds may be started for early vegetables; early potatoes planted, in light soils, and the seeds sown of such hardy vegetables as beets, turnips, spinach, peas, and lettuce—provided the soil is in proper condition.

Flower Garden and Lawn.

Those who propose to improve their places, without calling in the aid of a landscape gardener, will find the elaborate work of Mr. Weidenman,

"*Beautifying Country Homes,*" a most useful guide, as it furnishes a great variety of plans, and gives practical suggestions of great value....Downing's "Landscape Gardening," is a standard work on the principles of the art, and others are given in the Publisher's book list. As a general guide for the

Management of Small Places, such as grounds in cities and villages, "Gardening for Pleasure," by Peter Henderson, will meet the wants of many, as it includes in one volume directions, not only for laying out the ornamental grounds, but for the management of the fruit, vegetable, and flower gardens. The best work on what may be called

Old-Fashioned Gardening, is Breck's "New Book of Flowers," in which the author talks about the usual hardy and tender flowers and shrubs in the pleasing and familiar manner of one who loves them.

Ornamental Flower Beds, and the planting of flowers and foliage in masses, are treated in "Practical Floriculture," and "Gardening for Pleasure," both by Peter Henderson.

Tree Planters will find in "The Book of Evergreens," the best work on evergreens in the language. It also treats of evergreen hedges.

Special Treatises, such as "Parsons on the Rose," and others, will be found in the book list.

Work in this Department consists in keeping everything in order, and in preventing injury from animals, and those thoughtless people, who disregard paths when snow is on the ground, and drive or walk "across lots." The manner of preventing injury to evergreens by snow, is given on page 22.

Greenhouse and Window Plants.

For the culture of plants under glass, whether in the greenhouse or in the window, the most generally useful works are "Practical Floriculture," and "Gardening for Pleasure," by Peter Henderson, the first named being more especially for those who cultivate flowers for sale, though the wants of small growers are not overlooked, while the other, intended especially for amateurs, gives more space to the window cultivation of flowers.

Window Plants should by this time be in flourishing condition; their health may be promoted by a thorough showering at least once a week; when the weather will allow, they may be set out doors; otherwise in a bath-tub or sink, and showered copiously, to remove dust....The hints as to insects given last month, will be timely so long as the plants remain in the house....Bring pots of bulbs from the cellar from time to time, to have a succession of flowers....Camellias flower best in a cool room, the buds are less likely to drop, and the flowers last much longer; when growth commences, give them a place at a warm window.

Severe Weather.—It happens almost every winter, that there are two or three nights so severely cold that the ordinary heating appliances will not keep the room warm enough to prevent freezing, at least at the window. At such times the plants should be placed in the middle of the room and covered with a sheet, or even with newspapers.

Frozen Plants will often recover if taken to a room where the temperature is just above freezing, and allowed to thaw very gradually. The change to a very warm room would be injurious.

Commercial Matters—Market Prices.

The following condensed, comprehensive tables, carefully prepared specially for the *American Agriculturist*, from our daily record during the year, show at a glance the transactions for the month ending Dec. 12th, 1877, and for the corresponding month last year:

1. TRANSACTIONS AT THE NEW YORK MARKETS.

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 d's *this* m'th	473,000	4,116,000	3,491,000	383,000	1,312,000	1,407,000
26 d's *last* m'th	394,000	4,201,000	3,516,000	408,000	1,114,000	1,503,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 d's *this* m'th	491,000	5,129,000	4,154,000	431,000	1,227,000	1,286,000
26 d's *last* m'th	415,000	5,941,000	4,267,000	428,000	1,443,000	1,397,000

2. *Comparison with same period at this time last year.*

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 days 1877	473,000	4,116,000	3,491,000	383,000	1,312,000	1,407,000
24 days 1876	333,000	2,267,000	2,358,000	126,000	560,000	1,050,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 days 1877	491,000	5,129,000	4,154,000	431,000	1,227,000	1,286,000
24 days 1876	381,000	2,414,000	2,387,000	97,000	312,000	923,000

3. *Stock of grain in store at New York.*

	Wheat.	*Corn.*	*Rye.*	*Barley.*	*Oats.*	*Malt.*
	bush.	bush.	bush.	bush.	bush.	bush.
Dec. 10, 1877	2,841,982	1,723,229	899,077	864,787	1,879,052	358,849
Nov. 5, 1877	991,374	2,643,502	166,949	368,429	1,770,759	328,388
Oct. 8, 1877	283,698	2,975,838	28,526	69,046	881,326	370,166
May 7, 1877	761,686	468,809	193,046	174,375	347,881	291,654
Feb. 7, 1877	3,083,819	2,302,261	374,142	671,114	956,114	388,605
Jan. 8, 1877	3,668,010	3,077,504	941,750	903,615	1,088,104	425,406
Dec. 11, 1876	3,110,283	3,385,554	218,841	873,310	1,182,322	512,041
Aug. 7, 1876	2,881,299	904,537	94,960	53,914	1,232,895	434,208
Apr. 10, 1876	3,393,074	282,140	68,429	200,381	706,282	486,942
Jan. 10, 1876	5,802,298	663,982	100,741	325,191	1,080,300	507,438

4. *Stock of Grain afloat in New York.*

	Wheat.	*Corn.*	*Rye.*	*Barley.*	*Oats.*	*Malt.*
	bush.	bush.	bush.	bush.	bush.	bush.
Dec. 10, '77	1,212,704	416,927	43,315	1,125,913	598,703	85,400

5. *Exports from New York, Jan. 1, to Dec. 12.*

	Flour.	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*	*Peas.*
	bbls.	bush.	bush.	bush.	bush.	bush.	bush.
1877	1,306,875	19,833,571	21,276,390	1,982,620	1,936,596	246,335	454,033
1876	1,823,050	23,606,295	16,339,741	1,281,949	88,097	619,118	669,246
1875	1,789,299	25,054,035	12,495,349	152,925	1,505	133,754	415,019
1874	2,055,423	33,700,159	18,329,781	641,661	3,320	110,334	425,553

6. *Tide-water Receipts at Albany, from opening of navigation to Dec. 8th:*

	Flour.	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*	*Malt.*
	bbls.	bush.	bush.	bush.	bush.	bush.	bush.
'77	29,100	12,713,500	28,631,100	1,282,700	5,530,900	4,228,700	607,500
'76	37,100	11,801,100	11,386,600	762,700	3,858,000	3,167,900	735,600
'75	113,600	21,335,200	8,581,800	250,900	3,533,600	3,108,300	659,800

CURRENT WHOLESALE PRICES.

	Nov. 12.	Dec. 12.
PRICE OF GOLD	102 5-8	103
FLOUR—Super to Extra State	$4 80 @ 6 00	$4 85 @ 6 00
Super to Extra Southern	4 90 @ 8 75	4 90 @ 8 75
Extra Western	5 40 @ 9 75	5 45 @ 9 75
Extra Genesee	6 00 @ 7 50	6 00 @ 7 50
Superfine Western	4 90 @ 5 35	4 85 @ 5 35
RYE FLOUR	3 75 @ 4 45	3 65 @ 4 35
CORN-MEAL	2 70 @ 3 40	2 60 @ 3 25
BUCKWHEAT FLOUR, ₱ 100 lbs	3 35 @ 3 75	2 30 @ 2 75
BUCKWHEAT, per bush	83 @ 85	68 @ 69
WHEAT—All kinds of White	1 38 @ 1 55	1 42 @ 1 59
All kinds of Red and Amber	1 15 @ 1 47	1 15 @ 1 50
CORN—Yellow	63 @ 65	58 @ 66
Mixed	61 @ 63	57⅞@ 65
White	64 @ 65	58 @ 66
OATS—Western	34 @ 44	33½@ 43¼
State	37 @ 45	39 @ 44
RYE	66 @ 78	72 @ 78
BARLEY	68 @ 97½	70 @ 1 08
BARLEY MALT	70 @ 1 25	70 @ 1 25
HAY—Bale, ₱ 100 lbs	40 @ 90	40 @ 95
STRAW, ₱ 100 lbs	35 @ 65	35 @ 65
COTTON—Middlings, ₱ lb	11¾@ 11¾	11¼@ 11¾
HOPS—Crop of 1877, ₱ lb	5 @ 15	5 @ 13
" old, ₱ lb	2 @ 6	2 @ 6
FEATHERS—Live Geese, ₱ lb	45 @ 50	45 @ 50
SEED—Clover, ₱ lb	8½@ 8¾	8½@ 8¾
Timothy, ₱ bushel	1 35 @ 1 45	1 35 @ 1 40
Flax, ₱ bushel	1 45 @ 1 50	1 50 @ 1 52½
SUGAR—Refi'g & Grocery ₱ lb	7 @ 9¾	6½@ 9
MOLASSES, Cuba, ₱ gal. 50 test	— @ 40	38 @ 40
New Orleans, ₱ gal	32 @ 64	32 @ 48
COFFEE—Rio (Gold)	15½@ 19¼	16 @ 20
TOBACCO, Kentucky, &c., ₱ lb	4 @ 15	4 @ 15
Seed Leaf, ₱ lb	4 @ 50	4 @ 50
WOOL—Domestic Fleece, ₱ lb	26 @ 55	26 @ 55
Domestic, pulled, ₱ lb	28 @ 38	28 @ 38
California, spring clip	12 @ 31	12 @ 31
California fall clip	10 @ 25	10 @ 25
TALLOW, ₱ lb	7⅝@ 7⅞	7¼@ 7⅝
OIL-CAKE—₱ ton	$4 00 @35 50	$4 00 @
PORK—Mess, ₱ barrel	14 25 @ —	13 12½@13 50
Extra Prime, ₱ barrel	— @ —	9 00 @ 9 50
BEEF—Extra mess	13 00 @14 00	13 00 @13 50
LARD, in tres. & bbls, ₱ 100 lb	8 00 @ 9 25	8 12½@ 8 90
BUTTER—State, ₱ lb	15 @ 35	12 @ 35
Western, poor to fancy, ₱ lb	12 @ 35	9 @ 35
CHEESE	5 @ 13	5 @ 13
EGGS—Fresh, ₱ dozen	22 @ 26	20 @ 26
POULTRY—Fowls & Chickens	10 @ 15	8 @ 14
Turkeys—₱ lb	10 @ 15	7 @ 16
Geese, ₱ pair	1 25 @ 2 00	1 12½@ 2 00
Ducks, ₱ pair	50 @ 90	50 @ 75
Roosters, ₱ lb	6 @ 8	6 @ 7
DUCKS, Wild, ₱ pair	30 @ 65	25 @ 2 50
GROUSE, ₱ pair	85 @ 1 00	50 @ 1 00
PARTRIDGE, ₱ pair	40 @ 80	40 @ 75
QUAIL, ₱ dozen	— @ —	75 @ 1 50
PLOVER, ₱ doz	1 25 @ 1 37½	1 25 @ 1 37
SNIPE, per doz	30 @ 1 37½	30 @ 1 37
WOODCOCK, ₱ pair	50 @ 65	Nominal.
VENISON, ₱ lb	14 @ 18	7 @ 12
RABBITS, ₱ pair	— @ —	40 @ 50
HARES, ₱ pair	40 @ 50	25 @ 30
TURNIPS ₱ bbl	60 @ 75	60 @ 75
CABBAGES—₱ 100	1 25 @ 3 50	2 00 @ 3 00
ONIONS—new, ₱ bbl	1 00 @ 1 25	1 50 @ 2 00
LETTUCE, ₱ bbl	50 @ 1 00	50 @ 1 00
CARROTS, ₱ 100 bunches	87 @ 1 00	50 @ 75
POTATOES—₱ bbl	1 25 @ 2 00	1 25 @ 2 12½
SWEET POTATOES—₱ bbl	1 75 @ 2 25	1 50 @ 2 50
TOMATOES, ₱ box	20 @ 30	Nominal.
BEETS, ₱ bbl	50 @ 1 00	50 @ 75
PEAS—Canada, in bond, ₱ bu	88 @ 85	85 @ 86
green, ₱ bush	1 40 @ 1 50	1 40 @ 1 45
BEANS—₱ bushel	1 80 @ 2 75	1 70 @ 2 65
BROOM-CORN	3¼@ 7½	4 @ 7½
PEPPERS, ₱ bbl	1 25 @ —	Nominal.
APPLES—₱ barrel	1 00 @ 3 50	1 75 @ 3 00
CELERY, per dozen	— @ —	75 @ 1 00
CAULIFLOWER, ₱ bbl	1 00 @ 3 00	1 00 @ 3 50
OKRA, ₱ 100	15 @ 20	15 @ 20
PEANUTS, domestic, ₱ bush	1 00 @ 1 30	1 15 @ 1 50
GRAPES, ₱ lb	4 @ 9	3 @ 7
PEARS, ₱ bbl	1 25 @10 00	Nominal.
QUINCES, @ bbl	4 00 @ 8 00	— @ —
CRANBERRIES—₱ bbl	5 00 @ 6 50	5 00 @ 6 50
₱ bkt	2 00 @ 1 00	— @ —
ORANGES, Florida, ₱ bbl	— @ —	5 00 @ 8 00

Gold has been up to 103⅜, and down to 102¼, closing Dec. 12, at 103, as against 102⅝ on Nov. 12; 103 on Oct. 12; 105⅜ on July 12; 104⅞ on June 12; 107¼ on May 12; 104⅝ on March 12; 106 on January 12, 1877; and 107¼ on the 12th of December, 1876....Dealings in Breadstuffs were quite extensive during the month, especially on export and legitimate home trade account, the speculative feature having been of less prominence, particularly toward the close. Prices have fluctuated considerably, but recently favored sellers, though leaving off less buoyantly. Foreign advices have been favorable, but the latest war and political reports from Europe, were viewed as less encouraging to the export interest. Flour, prime Spring Wheat, choice White Wheat, prime Mixed Corn, Barley, and Rye, attracted much attention from shippers in the local market. Of the purchases of Flour for the English trade, were important quantities, not only of regular shipping extras, but also of Minnesota Extras, (new process), and low and medium Winter Wheat Extras, with a fair proportion of Superfine. The depression in ocean freights served to stimulate export operations, as well in Flour as in Grain. The Barley movement for the United Kingdom has been on a liberal scale; State product lately entering freely into this outlet, particularly two rowed, within the range of 70 @ 78c. per bushel. Some very fancy samples of Canada product have been marketed at extreme figures, as high, in a few instances, as $1.08 @ $1.10, prime No. 1 closing, however, at $1 per bushel, free. Receipts of Grain have fallen off, near the close, through the partial suspension of inland navigation. The arrivals of Flour have been large, notably so of the less desirable qualities of Winter and Spring Wheat Extras, which have been accumulating here and quoted unsettled in price. Speculative control of Wheat and Corn supplies worked against regular trade operations..... Cotton has been ruling higher, on a brisk movement, largely on speculation, but closed weaker....Wool has been in fair but not urgent request; and has been quoted generally firm....Hay, Straw, and Seeds, moderately sought after, but variable as to price....Hops have been quite active, in good part for shipment, within the previous range....Tobacco has been quoted steady, on a moderately active call for supplies... Naval Stores and Petroleum were depressed and irregular, but left off more firmly, with a firm demand noted... Groceries have been selling more freely; Sugar and Molasses further receded in price, but the former closed stronger; Coffee higher; Teas unsettled ...Ocean freights were quoted lower on free offerings of accommodation, leading to an active business, leaving off more steadily, especially for Breadstuffs, Provisions, and Cotton....Grain rates by steam to Liverpool closed on the 12th of Dec. at 8¾*d.*; to Glasgow at 8¼@8¾*d.*; to London at 8¼*d.*; to Bristol at 9¼*d*; to Hull at 8¼@8½*d.*; to the Continent at 9@10*d.*; to Liverpool, by sail, 7½@7¾*d.*; London, by sail, 8*d.*, per bush. Flour to Liverpool, by steam, 2*s.* 6*d.*; London, by sail, 2*s.* 3*d.*, and by steam 2*s.* 6*d.*@2*s.* 9*d.*; Bristol, by steam, 3*s.* 3*d.* per bbl. Provisions by steam to Liverpool, 32*s.* 6*d.* @ 40*s.* per ton; Cotton by sail $^{9}/_{32}d.$, and steam at ¼@$^{9}/_{32}d.$ ₱ lb. Grain, by sail, for Cork and orders, at 6*s.*@6*s.* 4½*d.*, and to Continental ports, 6*s.* 3*d.* @6*s.* 6*d.*; Italian ports, 5*s.* 3*d*@6*s.* per quarter.

Prices of Feed.

Bran, per ton	$18.00@$20.00
Middlings, per ton	19.00@ 21.00
Ground Feed, per ton	15.00@ 21.00
Linseed-oil-cake, western, per ton	41.00@ 47.00
Cotton-seed-cake, per ton	35.50@ 40.00
Chandler's Scraps, per lb	3@ 4

Prices of Fertilizers.

No. 1. Peruv. Guano 10 p. ct. ammonia, standard, ₱ ton	$56.50
do. do. Lobos, do. do. do	47.50
do. do. guaranteed, ₱ ton, cargo F	56.00
do. do. rectified, per ton, 9.10 p. c.	60.00
do. do. do. do. 8.40 p. c.	51.00
Excelsior Fertilizer Works, Fine Ground Raw Bone	55.00
Mapes' Complete Manure (Ville formula), p. 1,000 lbs	36.14
do. Spring Wheat Manure, ₱ 1,000 lbs	25.00
do. Fruit and Vine Manure, do.	17.50
do. Bone, strictly pure, meal .....per ton.	42.00
do. do. do. extra fine.... do.	40.00
do. do. do. fine..... do.	38.00
do. do. do. medium..... do.	36.00
do. Lawn Top Dressing..... do.	60.00
do. Potato Manure, (Ville Formula)... do.	51.94
Stockbridge Corn Manure, (Boston) per acre	22.00
" Potato do do do	12.00
" Tobacco do do do	60.00
" Rye do do do	11.00
" Wheat do do do	16.00
Bowker's Hill and Drill Fertilizer, per ton	45.00
Sulphate of Magnesia (55 to 60 per cent), per ton	30.00
Gypsum, Nova Scotia, ground, per ton	7.00@8.00
Nitrate of Potash (95 per cent.), per lb	9½c.
Sulphate of Potash (actual potash 44 per cent) per lb	4 c.
do. do. (actual potash 27½ per cent) per lb	2 c.
German Potash Salts (actual potash 12 to 15 p. c. p. ton	$18.00
Muriate of Potash (actual potash 50 per cent), per lb	3½c.
Nitrate of Soda, per lb	4½c.@ 5 c.
Sulphate of Ammonia (25 per cent.), per lb	5 c.@ 5½c.
Dried Blood or Dried Meat (ammonia 14 per cent) p. ton	$50

New York Live-Stock Markets.

RECEIPTS.

WEEK ENDING	*Beeves.*	*Cows.*	*Calves.*	*Sheep.*	*Swine.*
Nov. 19	8,568	69	1,593	23,565	38,548
Nov. 26	9,453	80	1,062	28,859	32,529
Dec. 3	7,310	72	879	11,772	31,694
Dec. 10	11,573	92	1,097	32,026	45,093
Total for 4 Weeks	36,904	314	4,631	96,222	147,854
do. *for prev. 4 Weeks*	37,480	349	8,631	116,198	129,055

	Beeves.	*Cows.*	*Calves.*	*Sheep.*	*Swine.*
Average per Week	9,226	78	1,157	23,805	36,963
do. do. *last Month*	9,370	87	2,157	29,049	32,263
do. do. *prev's Month*	11,035	96	3,028	29,014	26,868

Beeves.—A very poor and depressed market marked the opening of the month. The only sustaining influence was that of the demand for foreign shipment, without which, one can not tell to what extreme of lowness prices would have fallen. A gradual improvement, however, is to be noticed, and the month closes with a more healthful market, showing a better demand with some advance in prices. The excessive receipts alone prevented a greater improvement. Extra good Kentucky and Illinois cattle of 1,600 to 1,700 lbs., sold for 11c. for 57 lbs., and 11¼c. for 58 lbs. to the cwt. Medium to good natives, sold for 9c. @ 9¼c. ₱ lb., and thin steers and oxen, Texans and Colorados, from 8¼c. @ 9c. ₱ lb.

The prices for the past four weeks were as follows:

WEEK ENDING	*Range.*	*Large Sales.*	*Aver.*
Nov. 19	7¼@11¼c.	8½@10¼c.	9¼c.
Nov. 26	7 @12 c.	8½@10½c.	9¼c.
Dec. 3	8¼@11¼c.	9 @10½c.	9¼c.
Dec. 10	7½@11¼c.	9 @11 c.	9¾c.

Milch Cows.—There has been a very poor demand for cows of more than usually poor quality, and these have been in more than usual supply. As low as $30 has been

paid for cows the past month. Good cows sell for $65@$70, and are wanted....**Calves.**—Hog-dressed are now arriving in sufficient numbers to affect the price of grassers and live veals. Grass calves sold at the close at 3½ @ 4½c. ℔ lb., alive; the best veals brought 9@9½c. ℔ lb. These prices were an advance, which was gained through the smaller receipts during the month. ....**Sheep and Lambs.**—Good sheep were never so low in this market as they now are. Mutton is not a fashionable meat, or is not estimated as well as it might be. With present prices, farmers might add to their flocks with profit. The best sheep that have appeared here in some years, sold for 6½c. ℔ lb., alive, and fine Canada ewes brought 5@5½c. ℔ lb. Fair lambs ranged from 6½@6¾c. ℔ lb., live weight....**Swine.**—The market has been "see-sawing" back and forth during the month, ending where it began, the excessively heavy receipts bringing the scale down rapidly at the close, with a promise of worse to come. Live hogs have been dull at 4¾@4¾c. ℔ lb., and city dressed at 5¾@6c. ℔ lb.

containing a great variety of Items, inc'uding many good Hints and Suggestions which we throw into smaller type and condensed form, for want of room elsewhere.

Publishers' Notices, Terms, etc.—The Annual Subscription Rates of the *American Agriculturist*, postage prepaid by the Publishers, are: One Copy, **$1.60 a year**; *Two* Copies, $3; *Three* Copies, $4.20 ($1.40 each); *Four* Copies, $5.20 ($1.30 each); *Five* to *Nine* Copies, $1.25 each; *Ten* to *Nineteen* Copies, $1.20 each; *Twenty* Copies and upwards, $1.10 each; Single Numbers, 15 cents, post-paid.—The above terms are for the United States and Territories, and British America. To the above add 14 cents extra per year for papers delivered by mail in N. Y. City, and for copies sent outside of the United States and British America, *except* to Africa, Brazil, British Honduras, the East Indies, and Mexico. For the last named five countries the extra charge is 36 cents per year, to cover extra postage; Single Numbers, 17 cents, post-paid.....**Remittances,** payable to Order of Orange Judd Company, may be sent in form of Checks or Drafts on N. Y. City Banks or Bankers; or P. O. Money Orders; or in Registered Letters, such letters to have the money enclosed in the presence of the Postmaster, and his receipt taken for it, and the postage and registering to be put on in stamps. Money remitted in any one of the above three methods is safe against loss. **Bound Volumes** from Vol. 16 to 36 inclusive, supplied at $2 each, or $2.50 if to be sent by mail. Sets of numbers sent to the office will be bound in our regular style for 75 cents (30 cents extra if to be returned by mail). Missing numbers for such volumes supplied at 12 cents each.—**Any Numbers** of the paper issued for 21 years past, sent post paid for 15 cents each.... **Clubs** of Subscribers can be increased at any time at the club rates, if new members begin at same date as original club.

The German Agriculturist, with its beautiful new cover, and other improvements, is giving great satisfaction. Will our readers please inform their German friends and neighbors of this German paper, issued now for 20 years. It is every way equal to the English edition, with a Special and extra German Department, Edited by Hon. Fred. Münch. Terms, the same as the English edition, with which it may be joined in making up clubs.

Advertisers will find a valuable medium in the *German Agriculturist*. The rates are very moderate, and the paper circulates largely among readers who are not reached through other channels.

Advertisements in numbers entirely unlooked for, crowded in at the last moment, and entirely upset the Editor's plans for several pages of reading matter, which must go over. But these business notices are from "good men and true," and give a good deal of information our readers are interested in. So read through the advertisements, and when writing to any advertiser tell him *where* you saw his advertisement.

N. B.—Please Observe. Take Notice.—It is a waste of time, talent, stationery, and post stamps, to write us a letter and *not sign it* with full name and address. We have no time to devote to nameless people, and the waste-basket receives their letters. Please don't write to ask about advertising "doctors"—we do not know anything about them. Please do not preface your letters with a long apology, stating that you have "never troubled us before." If the inquiry made is a sensible one, it is not "troubling" us. We wish for such, and are glad when they come. If you have taken the paper for five or ten years, and have never before asked a question, we are sorry both on your account and our own. One more request:—Please don't write with pencil, but better that than pale ink. Recollect we have to look through letters by the hundred, and pale ink, or what is worse still, red ink on pink paper is trying.

A Microscope for All.

Important Notice!

The Microscope offered to our readers last month, proves to be quite as valuable as we hoped it would be. It is a capital instrument for all the purposes for which it was recommended, and more. We hear of a few who have as yet failed to appreciate its real merits, but we know that comes from lack of experience in using such instruments. We shall try to aid such to a proper understanding of its use. A beginning is made in this paper, (see page 10.)—Many scientific men, and many others familiar with microscopes, have examined this one, and all speak of it with the *highest praise*. We *know* that when our readers become accustomed to using it properly, *it will be a source of much pleasure, and will be turned to practical utility as well.*

It costs a good deal more to supply them, than is charged for them above the subscription rates; but this was anticipated, and a round sum set aside by the Publishers to meet the additional expense—the same sum, or more rather, than has in past years been expended upon Chromos for free presentation. And now we want every reader of this journal to have and enjoy one, though it would be a saving of expense if but few take them. Our only regret is that it is not possible to give them outright.

As many thousands of *new* subscribers are coming in who did not see the last number of this paper, we republish in part, on page 33, the description, etc., of the Microscope, *which please read.*

Important about the DELIVERY of the Microscopes.

The average cost of delivering one of these Microscopes, with the strong double-cover box needed, is 15 cents, to any point in the United States and the Canadas. We do not add this to the extra charge above the subscription price, and call it 55 cents, because our subscribers come largely in clubs, and all the Microscopes going to one club, can be sent in a single package, unpaid, to some member of the club, who should be designated, and the cost of carriage will be but a trifle on each.—Thus, if 10 or 20 go in one parcel, and the express charges are 25 to 50 cents on the whole, the cost of carriage will be only 2½ to 5 cents each.—We therefore only require the 15 cents when we send them prepaid. *We can not pay this.* There is not profit enough on subscriptions to pay the extra cost of the Microscope above what is charged for them, much less to pay for the carriage also.

We have now a special arrangement with the ADAMS, the AMERICAN, and the UNITED STATES Express Companies, to deliver the Microscopes singly to any point in the United States or Canadas, where they have offices. This arrangement is only temporary, but we hope it may be continued through the winter. They will give us sufficient notice, if it is not continued, to notify our readers in the following number. Where there is no office of any one of these companies, we provide other means of delivery. The terms are:

One Subscriber for 1878 and one Microscope,	Taken at the Office or forwarded unpaid,	$2.00.	If sent *prepaid*,	$2.15.
Two Subscribers for 1878 and two Microscopes,	.....do.....	$1.90 each.	do.	$2.05 each.
Three Subscribers for 1878 and three Microscopes,	.....do.....	$1.80 each.	do.	$1.95 each.
Four Subscribers for 1878 and four Microscopes,	.....do.....	$1.70 each.	do.	$1.85 each.

For terms to large clubs see page 34. The **Order of Delivering the Microscopes,** will be in the order of reception of names. "First come, first served." Over **60** men are working on them with machinery. The call is beyond expectation. They will come as fast as made. Let no one be anxious if his Microscope happens to be delayed a few days. It will come in due time sure.

Wintering Cows on Meal Alone, is a subject of much interest to dairymen. The address of Linus W. Miller, read before the American Dairymen's Association, and other meetings, has created much interest in what is now called the "Miller System" of feeding. As innovators upon established customs are apt to be misrepresented (not always intentionally) by their opponents, it is better for those who would investigate the matter, to read Mr. Miller's own presentation of it. This he gives in a pamphlet of 32 pages, which may be had from this office, post-paid, for author's price, 50c.

"The Omaha, Neb., Pioneer," for December, contains much valuable information for those who contemplate emigrating to the West. It is sent free on application to Mr. O. F. Davis, Omaha.

J. B. Root's "Garden Manual."—The sudden death of J. B. Root, of Rockford, Ill., was noticed just a year ago. He was in his department a leading man, and his contributions to the *American Agriculturist*, and other journals, were marked by great originality, and were valuable contributions to the literature of vegetable gardening. He was largely engaged in seed growing, and the business is now carried on by Mrs. Root, to whom we wish much success. The present issue of the "Garden Manual"—which includes a catalogue—is made up of articles left by Mr. Root, and selections from those that have appeared elsewhere, and characteristically fresh, practical, and sensible.

An Iron Mattress.—Probably the most comfortable of all beds is one of that hardest of substances—iron. Paradoxical as this may seem, we know it, by experience, to be true. Iron in the form of wire may be so woven, netted, and arranged with springs as to make a bed that readily adapts itself to the form, and recovers its shape at once when the weight of the body is removed. We have tried the article made by the "National Wire Mattress Co.," of New Britain, Conn., and find it to be as nearly perfect as need be.

The Pennsylvania Fruit Growers, Society will hold its annual meeting at Williamsport, Pa., commencing January 16th, 1878. It is expected that several prominent horticulturists will attend, and address the meeting, and an interesting session is expected. Josiah Hoopes, Westchester, is President, and E. B. Engle, Marietta, Secretary.

The Hessian Fly.—How far does it extend West and South? is what Prof. Packard, Secretary of the U. S. Entomological Commission, would like to know. In order to aid him in studying the distribution and extent of the ravages of this pest to wheat growers, Prof. P. would like specimens from the Middle or Western States. Send so that they will not be crushed, by mail, to Prof. A. S. Packard, Jr., Salem, Mass.

Senders of Papers.—It often happens that one wishes us to see an article he has published in some paper, or to call our attention to some particular article. The most certain way is to cut out the article, giving the name and date of the paper, and send it with the letter. But if a paper is sent for the purpose, please *mark the article* distinctly, by lines drawn against the heading, and also put upon the wrapper "Editorial." Unless these precautions are observed, the paper, among the hundreds that come daily, may never reach us.

The "American Journal of Microscopy," edited by Prof. John Phin, and published in New York, is especially valuable as a means of communication between those engaged in microscopy, and its articles are of a popular character—and not merely for the small class of experts.

The A B C of Bee Culture, is the title of a new Cyclopædia of Apiarian matters. Part I. contains 48 pages, with 20 engravings, and in the alphabetical arrangement extends to "Comb Honey." It is published at Medina, Ohio, by the author, A. I. Root, at the moderate price of 25c.

New Jersey is a State sometimes sneered at by those who know nothing about it, for its old fogy ways. It easily took the lead at the Centennial Exhibition, and if any other State has published a report of its part in the Exhibition in any handsomer or more complete form than New Jersey, we should like to see it.

To Be Had Without Money.

PLEASE REMEMBER that Our General Premium List, published in October, is still in FULL FORCE, and will be during the winter. Multitudes of our readers, all over the country, can *each* secure one or more *useful* and *very desirable articles* **free,** by the little trouble required to collect three, four, five, or more, names of those who would subscribe for the Journal if shown to them by some one. Over **20,000** of our readers have received these premium articles, and thousands more ought to get them this month, and during the winter. Every person induced to take and read such a Journal, will be benefitted in the end. The Publishers can not go to individuals to present the paper to them, and they offer these good premium articles as *rewards* to those who do so. See the list of articles on page 33, and if you have not the Illustrated Sheets describing each article, send immediately for a free copy.

Many persons canvas as a *business*, receive the premium articles, and dispose of them for cash, (for they are all good and readily salable), and thus realize a fine income. **This Month** is a good time to enter upon such a work.

Take Notice.—The offer of the Microscope to *every* subscriber, whether in a premium list or not, does not at all interfere with making of lists for premiums, but will rather aid in the work, for *every* subscriber for 1878 is entitled to call for one of the Microscopes on paying a small extra charge above the subscription price, as stated on pages 33, 34. The Paper alone is worth all that is asked for it. The Microscope is worth to any person *much more* than the whole cost of both the Microscope and the paper for the whole year.—So push along the gathering names, to secure premiums for yourself, and let all who have it not send a postal card at once for our Illustrated Premium Sheet, which we mail free to all applicants.

The North Western Dairy Exhibition.—The exhibition of dairy products by the North Western Dairymen's Association, was held at Chicago, December 18th, and following days. The exhibition opened with over 2,000 parcels of cheese and butter, from all the dairy States and Canada, and more arrived afterward. President Hewes opened the proceedings with an address, and others followed. The attendance of visitors was large, and the exhibition very successful.

What Scientific Men Say.—Numerous letters and verbal commendations have come from the best practical judges of the real value of a microscope. Among others, **Prof. Phin,** Editor of the *American Journal of Microscopy*, writes, Dec. 11, as follows:

MESSRS. ORANGE JUDD COMPANY:

"I have carefully examined your AMERICAN AGRICULTURIST MICROSCOPE, and am delighted with it. Having procured all the lower-priced microscopes offered for sale in this country during the past twenty years, I could not recommend one in my book on the Microscope. This of yours is really *good*, and shows well all the most interesting common objects. I have just seen clearly, with it, the beautiful globe-animalcule, (so-called), the cellular structure of plants, the trichina or so-called "pork-worms," and several other objects that require good microscopes. JOHN PHIN."

One of the Most Striking Steel Engravings we have lately seen, is that of BISHOP JANES, in the January Number of the "National Repository." Every lineament of the face is so accurately drawn and printed that the picture is instinct with life. The "Repository," by the way, is a most excellent family magazine, filled with safe reading of a high order. Our old friend, Dr. Curry, who has had long editorial experience, is working well into his new sphere of labor. Not having space for further notice of the "Repository," we refer to the Publishers' announcement on page 32.

The Western New York Horticultural Society, is one of the most useful of the various horticultural associations, and though it, usually, holds but one meeting a year, that one abounds in good results, and we always receive the account of its proceedings—furnished with commendable promptness, with the feeling that we shall surely find something worth reading. While the N. Y. Horticultural Society, holding its meetings and exhibitions in New York City, has florists' plants and flowers as its leading feature, the Western Society gives greater prominence to fruit, and thus the two admirably supplement one another. The 23d Annual Meeting of the Western N. Y. Society will be held at Rochester, N. Y., commencing on Wednesday, the 23d inst., and probably continue for two or three days. All interested in horticulture will be welcomed, and they are invited to exhibit their products. P. Barry is President, and P. O. Reynolds Secretary and Treasurer—both of Rochester.

Sale of an Arab Colt.—We are informed by Mr. J. J. Parker, of Westchester, Pa., that his Arab colt, "Arab Boy," the portrait of which was published in the *American Agriculturist* for June, 1877, has been sold for $1,000, to W. C. Myer, of Ashland, Oregon, whose attention was called to the colt by the above mentioned portrait. Mr. P. has long been a very successful importer and breeder of Percheron and Arabian horses.

A Watch-Case Time Table is sent us by the "Dexter Spring Co.," of Hulton, near Pittsburgh, Pa. There does not seem to be any direct relation between the well known carriage spring, called the "Dexter," and a R. R. time table, and we suppose that the "Co." send out these for amusement. It is a little engraved form, to be cut to fit the inside of a watch-case, and ruled so that one can readily write in the time that the cars leave and arrive at any desired point. It is for a hunting-case watch, and when the case is opened, the time and the R. R. schedule are both in sight.

Sundry Humbugs.

To the long-time readers of the *American Agriculturist*, it is not necessary to speak of the aims of this column, but as many new friends always join our circle with the new year, (and this year the number promises to be gratifyingly large), these may need a word on the subject. In the early days of the *American Agriculturist*, an occasional exposure was given of the mock auction and other traps, set by sharpers to catch visitors from the country, and strangers were advised of the tricks practised at those places and warned against them, long before the authorities took up the matter, and broke up this form of swindling. From this small beginning, the exposure of other frauds followed, and the "Humbug Column" soon became a regular and necessary feature of the paper. We say "necessary," because a large share of the fraudulent schemes are directed towards the agricultural community. It is no disparagement to farmers to say this. These sharpers know that men who are so generally honest and upright in their dealings as are farmers, are of all men the least likely to suspect others. This is why such a large share of the swindles are directed towards the rural population; the rogues well understand human nature, and know that men who are honest themselves are slow to suspect others of dishonesty.

THE OBJECT OF THESE EXPOSURES

then, is to warn our readers against fraudulent schemes of all kinds, and especially those directed against the agricultural community. While we fearlessly make such exposures as are demanded by the public welfare, it is to be distinctly understood that these columns can not be used to redress any private grievance, and it will do no good to write, as some do, a request that we show up this or that person as a "humbug," simply because the writer feels that he has been wronged by the party complained of. It is only those who are defrauding the public at large, and whose operations are detrimental to the general welfare, that are entitled to a place here. It has been said that no human ingenuity has been able to construct a lock so perfect that one with a little more ingenuity can not pick and open it. It is the same with laws as with locks, and it does not seem possible for the law-makers to frame a law so well guarded that an acute person can not get around and avoid it. An illustration of this is seen in the case of the parties who have been operating under the name of

RUSSELL & CO.

Circulars, pretending to be at first a settling up of the affairs of the "Louisville Lottery Association" by a supplementary drawing, and later enlarged to include "the Various Legal Lotteries," have been sent far and wide. To judge from the *bushels* that have come to us, the mails must have been loaded with them. These at first offered "a Gold Watch and Chain *valued* at $150"—to be had by payment of an "assessment" of $15—and later a lot of "Gold Jewelry" of 80 (more or less) different patterns, "valued at $280" (more or less), to be had by paying an "assessment" of $14 (more or less). This has been going on for months, and while we felt that it was the biggest kind of a swindle we *could'nt prove it*. All we could do was to warn our readers, on general principles, that people did not, could not, and would not sell for $15—watches, or anything else, worth *more than* that sum. Why people, when they receive such an offer, do not at once

TAKE A COMMON SENSE VIEW

of the case, is beyond our comprehension. But they don't. They send these circulars to us by the dozen and hundreds, asking our "opinion." What opinion can we give other than this? "We know of no persons doing business in New York who will give you any more than $15 worth of watch, jewelry, or anything else, for $15." Not only were we overrun with these inquiries, but the Police and Post Office authorities had similar applications from all quarters, concerning "Russell & Co.," and their allies, "Hetherington & Co." Though "Russell & Co.," and the others, were watched, so carefully were their plans laid, that the officials could find no grounds for arrest. People at a distance complained, but unless they could make a complaint here, in the courts, in person, nothing could be done; and so the matter went on. Recently, Anthony Comstock, Special Agent of the Post Office Department, has convinced the Department that these parties were using the mails improperly, and his presentation of the case induced

THE P. M. GENERAL TO ISSUE A MOST STRINGENT ORDER,

a part of which reads: "I do hereby forbid the payment by the Postmaster of New York City to the said Elias H. Elias, or to any person whatsoever of any Postal Money Order, drawn to the order of Russell & Co., the name used by said parties in the conduct of said scheme." In consequence of this order a large number of registered letters and Postal Money Orders have already been returned to their senders, who, if sensible, will thank the Postmaster General that they have been able to get their money back. It has long been suspected that Russell & Co. was only another name for Elias, and other well known operators in similar schemes. An assertion to this fact was made some time ago in a sensational article in one of the daily papers, but accompanied by no proof; but it appears that the Postmaster General is convinced that Elias is at the bottom of this—one of the most ingenious swindles of the day.

SEED SWINDLES ON FARMERS

are now as numerous as ever, and so important as to require a special article, which we hope to give before seed time comes. We are as desirous as any one can be, of bringing to the notice of our readers every novelty of real value, or which promises to be useful. Three are at present offered under new names, and names likely to deceive, very old plants. If these have any value at all, it is very local and limited, and if the seeds were offered at all, it should be under their proper and well known names. These

WONDERFUL AGRICULTURAL SEEDS

have of late been offered by heretofore unknown dealers in obscure towns in Tennessee, Michigan, and other Western States. Of course it is no prejudice to a good thing that it should have an obscure origin, but the things thus offered are either not good, or are offered under names likely to deceive. Thus "Ivory Wheat" is no *wheat* at all, but the old Durra Corn, a form of which is offered as "Pampas Rice," while it is no more *rice* than it is wheat. The "Diamond Wheat," which is offered with much flourish of names, including "Montana," and other kinds of "Rye," is, as we shall show at another time, one of the oldest grains in cultivation. So the "Hulless Oats," as "old as the hills," every now and then turn up as the basis of a disastrous swindle. The "Durra Corn," the "Polish (though now called 'Diamond Wheat,' and by many other names,) Wheat," the old, very old, "Hulless Oats," all these, almost as old as agriculture itself—many have their uses, but to introduce them as *novelties*, or under new names, shows, on the part of those who advertise them, either

IGNORANCE OR FRAUDULENT INTENT,

and so far as the purchaser is concerned, it makes no difference which. Let every farmer and gardener be assured that unless a "novelty" in the way of field or garden seeds has the endorsement of some agricultural paper—is either commended by the editor of the paper, or by some correspondents, whose accuracy the editor endorses—let him be sure that he can afford to wait, or if he tries the thing at all, let him do it on a scale so small that failure will be of no serious detriment .. In beginning our war against Humbugs, for the new year, we have given prominence to one, the influence of which for evil is shown, by our correspondence, to be the most widely extended, and another month propose

to pay attention to others, which, operating in a smaller way, are none the less pernicious. One of the biggest of

THESE SMALL HUMBUGS,

is one E. C. Abbey, "M. D.," of Buffalo, who advertised everywhere his "Puzzle Picture, the Toll-Gate."—Very innocent indeed is the advertisement.—We saw it in a religious paper, edited by a distinguished "D. D.," whereupon we sent the good Doctor of Divinity the "Toll-Gate" itself. The advertisement did not appear in that paper any more. Now this same Abbey advertises in religious and other family papers his "puzzle picture" of "THE TRUANT BOY," and, like the "Toll Gate," it is a (so-called, but very poor) "puzzle picture" on one side, and on the other side, we have just such an advertisement as went with the Toll Gate, and one which no parent would wish his son to read. The card of the rascal says:—"This picture is 'intended to introduce a *far more interesting Book*,' (the *italics* are his), containing new truths never before in print"— * * * with portrait of the author, (Oh!) It tells all about Manhood, Womanhood, Sex, Beauty—well, we can't, in decency, tell the rest. Now you gentlemen who publish religious and family papers, won't you, in the interest of common decency and morality, just send and get a copy of the "Puzzle Picture" which you advertise to the young of both sexes, and who suppose that nothing improper can appear in your pages. Won't you, we say, send and get one of the things you advertise. You will get something which you *dare not* read aloud in your family circle. Yet you invite all to get the vile thing.

IN THE MEDICAL LINE

are several things that must have attention soon. If you get an alarming circular, headed "Diphtheria Suffering and Death," from Honesdale, Pa., put it in the fire, and read what is said about diphtheria on page 25.

THINGS GOOD TO LET ALONE

are a "Wonderful Tea Importing Co." in Cincinnati.... Likewise the various concerns which are after owners of property in England, Scotland, and Wales, of which, no doubt, "the rightful heirs" are perversely keeping the many Smiths, Joneses, and Robinsons out of... Also, those Telegraph Schools, which promise good situations at high salaries, are to be investigated before paying for "scholarship."....If any one has money to throw away, there are still several "Mining Companies," notwithstanding the inglorious fizzle of the "Silver Mountain" concern, that will take in all that may be offered....We can well understand the indignation with which a gentleman doing a respectable business in Connecticut, opened a letter addressed to his recently deceased father, informing him that he (the father) had been recommended to the writer as a "reliable party" to assist in the "disposal of some goods," which "goods" were counterfeit money. If the son had kept the run of our exposure of this worst of swindles, he would have known that no one was safe from vile proposals, and that the few who were caught were most deservedly fleeced.

A Personal Convenience.—We do not know what it is called, but it was sent us by J. S. Birch & Co., No. 33 Dey St., who have so long advertised their "Universal Watch Key" in our columns. The article is about the size of a coat button, and fastens to the vest like a breast-pin. It has a cord, and at the end of the cord a hook, to which the eye-glasses are attached. The cord is taken up within the button by a spring, and the glasses are ready for use, or out of the way in an instant, by the proper management of this very clever contrivance.

The Value of Starch Factory Refuse.—"F.," Ashland, Me. The "slump," or waste from starch factories contains all the substance of the potatoes except the starch. If this waste, along with the vines, is returned to the soil, it is difficult to say why potatoes may not be raised many years in succession upon the same field, without exhaustion. The starch is wholly carbon and hydrogen, which are plentifully supplied by the atmosphere and by water, there is probably a loss of some (but very little) nitrogen in the finer portions of the potatoes which escapes with the waste water.

What Is a Cord?—"J. M. E.," South America, Ill. There are 128 cubic feet in a cord of wood, or a cord of manure; a cord being a heap 8 feet long, 4 feet high, and 4 feet wide. A cord foot is a 32nd part of a cord—that is, it is a heap of wood having a face one foot square, irrespective of its length. A cord of stove-wood consists of 32 cord feet, and if the wood is one foot long, would be a pile 8 feet long, 4 feet high, and one foot wide, containing 32 cubic feet; if the wood were 2 feet long it would contain 64 cubic feet.

Shrinkage of Grain.—The loss of weight and bulk of grain in process of drying, is from one-fifth to one-fourth for corn, and one-twelfth to one-tenth for wheat, and other small grains. In addition to this shrinkage there is the loss by the depredation of vermin, and that of interest on the value until the grain is sold. The whole amount of loss is a serious item, but one that rarely enters into the farmer's calculation when he determines to hold over his grain until the spring, or next summer, for an advance of a few cents a bushel. Instead of gaining by this, he very often loses, and the loss may easily be figured up to from one-sixth to one-fourth of the crop, or its value, when harvested.

Ringbone.—M. W. Patterson, Clark Co., O. The only cure for ringbone is blistering. The hair should be shaved off from the part, and some common blistering ointment rubbed in. When the blister acts, the part should be washed and sweet-oil applied.

Apples Rot upon the Trees in Mississippi, and N. L. L. asks how to prevent it. The very first step will be to ascertain if he has varieties suited to his climate, and of this nothing is said. Northern varieties, as a general thing, do not succeed, but there is a set of fine Southern apples that do finely in his State. The varieties being all right, we should look first to drainage, and next to nutrition; if the trees are poorly fed, the fruit will complain.

Winter Oats.—"A. A. H.," Cumberland Co., Tenn., writes in regard to Winter Oats, that "they are not so hardy as Winter Wheat, although they are more extensively grown of late than previously." To test this matter, we have procured seed for one acre of these oats, and have sown them: if they succeed we shall report the fact in good season next year.

How to Manage a Farm.—"J. K.," Chicago. We have not space in any one number of the *American Agriculturist* to explain fully how a farm should be managed by one who knows nothing of the business. A pretty good idea could be gained by reading a whole volume, and carefully noting the Hints for Work, and the seasonable articles published every month.

Insects from Spain, sent by "H. G.," were crushed and in fragments beyond all recognition. Even for short distances it is necessary to send insects in a box or something which will keep them whole.

Is Meal Best Dry, or Scalded.—"J. E. W.," Frankfort, Ky. If the labor is not too great, it would be better to scald the meal, rather than to feed it dry. It is less apt to cause indigestion when scalded and fed moist.

How to Burn Lime in Heaps.—"E.," Athens, Ohio. Lime, where there is no kiln, may be burned in heaps, lain up upon a foundation of dry wood and made in alternate layers of wood and limestone. The heap is covered with sods, or coarse hay and earth, as charcoal pits are, and burned in precisely the same manner, except that the fire is made to burn briskly instead of smouldering; the lime is completely burned in three days. Lime may be spread upon the land to advantage in the spring.

When to Sow Orchard Grass.—"E. S.," Athens Co., Ohio. Orchard grass makes the best pasture for early use. It succeeds best if sown by itself on well prepared ground early in spring.

Coal Tar and Coal Ashes.—Coal tar is hurtful to shingle or board roofs, unless it is first mixed with some air slacked lime to neutralize the acid contained in it. Coal ashes have no appreciable fertilizing value.

Shorthorns and Durhams are the same. "J. A. T.," Georgetown, Mass. The Shorthorn cattle were first bred largely in the County of Durham in England, and near the river Tees. Hence they were called Durhams and Teeswater, as the case might be. In a few years they were spread all over England, and the name Shorthorn was given them to distinguish them from the formerly popular Longhorns, and stock that was not thoroughbred. When the Shorthorn Association was formed, and a Herd-book was established, the old names were dropped, except by those who were not well informed about the matter. A few of these keep the old names yet, which leads to confusion.

"Fern Leaf Mottoes."—In these, ferns (which have no "leaves" proper), are made to work in a good cause. Their fronds, and parts of them, are neatly arranged to form such mottoes as "God Bless our Home," and to surround them with a border. Impressions of these, fixed by photography in black and white, form very pretty ornaments. They are sold in considerable variety, solely where they will aid in the work of both foreign and home Missions. Particulars may be had of Mrs. J. R. Nicholas, Darby P. O., Philadelphia, Pa.

Catalogues Received.

The catalogues of seedsmen, nurserymen, florists, etc., are not usually ready before February. We give those that have thus far come to hand, placing them, as usual, in order not to give one precedence of another, in alphabetical sequence.

NURSERYMEN.

G. H. BANTA, Riverdale, Bergen Co., N. J., offers at the Glenwood Nurseries a general assortment of fruit and ornamental stock.

SAMUEL C. DECOU, Moorestown, N. J., makes a specialty of small fruits, offering the latest novelties.

A. HANCE & SON, Red Bank, N. J., send both their wholesale and retail list of a full and varied stock, with many novelties and specialties.

R. S. JOHNSTON, Stockley, Del.—A general nursery stock, with several new peaches.

RANDOLPH PETERS, Wilmington, Del., at the "Great Northern and Southern Nurseries" offers a very large stock. He makes a specialty of peaches, and his list and its classification is an interesting study to all proposing to plant peach trees.

E. WARE SYLVESTER, Lyons, N. Y., sends an abridged but comprehensive list of fruit and ornamental stock.

SEEDSMEN.

WM. H. CARSON, 125 Chambers street, New York City.—Special circular describing the Egyptian or "Pearl" Millet, a new "Spiral Mignonette" and other novelties.

DAVID LANDRETH & SONS, Philadelphia, Pa., send their "Rural Register and Almanac," including a catalogue of the seeds raised and sold by this well known firm.

J. B. ROOT, Rockford, Ill.—The Garden Manual for 1878, and Seed Catalogue—the business of seed growing and selling being continued by Mrs. Root.

CHARLES SIZER, Mount Lebanon, Col. Co., N. Y., is quite early with his "Shaker's Catalogue and Amateur's Guide to the Flower and Vegetable Garden." The catalogue is neat, full, and well illustrated.

E. WYMAN, JR., Rockford, Ill., is out with his catalogue of flower and vegetable seeds for 1878, the flower seeds predominate, and good cultural directions given.

FLORISTS.

WM. E. BOWDITCH, 645 Warren street, Boston, Mass., offers greenhouse plants and seeds.

L. B. CASE, Richmond, Ind., issues a "Botanical Index," quarterly, as a combined magazine and catalogue.

J. C. MCCONNELL & Co., Jacksonville, Ill., have a very full stock of greenhouse and bedding plants, roses, bulbs, and florists goods.

HENRY A. DREER, 714 Chestnut street, Philadelphia, Pa., though perhaps best known as a seedsman, sends a separate catalogue of greenhouse and other plants, showing that his stock in this line is very large and up with the time.

EUROPEAN CATALOGUES.

WM. BRYCE & Co., Glasgow (Scotland), and London (England).—A wholesale price list of vegetables and agricultural seeds.

LENAULT-HUET, Ussy, France, W. L. Ferris & Co., Poughkeepsie, N. Y., agents.—A general nursery catalogue, the English of which is very Frenchy, but the collection is a fine one.

WAITE, BURNELL, HUGGINS & Co., London, (Eng.), and Paris, (France.) This, one of the great seed houses of Great Britain, has now a branch house in France. Besides a wholesale price current of seeds of all kinds, they send a special list of Lilies, Gladioluses, (they have it "Gladioli") and other spring bulbs.

WILSON & RANKIN, Glasgow (Scotland).—A wholesale list of farm and garden seeds, very full in the grasses.

MISCELLANEOUS.

E. WEBSTER PECK, 110 Chambers street, N. Y.—Scroll saws, designs and materials, and ornamental iron work, including aquaria, ferneries, etc.

GEORGE SUCH, South Amboy, N. J.—A price list of cream-colored flower-pots, including very large sizes.

TRUMP BROS., Wilmington, Del.—Scroll saws of several patterns, and all the appliances and materials belonging to the art of scroll sawing.

RACINE HARDWARE MANUFACTURING Co., Racine, Wis., issue a handsomely illustrated catalogue of the ornamental and useful articles made by them.

MACHINERY, IMPLEMENTS, ETC.

C. & G. COOPER & Co., Mount Vernon, O., send their 42d Annual Catalogue, which indicates that this is no new concern. They make a great variety of agricultural and other steam engines, mills, and other machinery.

GEO. W. RUE, Hamilton, O.—A catalogue of his popular potato diggers, his seed drills, etc.

STEDMAN & Co., Aurora, Ind., offer a great variety of engines, boilers, mills, presses, and other agricultural machinery.

J. W. STODARD & Co, Dayton, Ill.—An illustrated account of the "Tiger" Sulky Hay Rake.

THE FARMERS FRIEND MAN'F'G Co., Dayton, Ohio, issue a neat pamphlet, giving a detailed description of their Grain Drill, and illustrate the peculiar excellencies claimed for their machine.

THE MANSFIELD MACHINE WORKS, Mansfield, Ohio, send illustrated catalogues of their Agricultural Steam-Engines, Saw Mills for farm use, Grist Mills, and other agricultural machinery.

THE STRAUB MILL Co., Cincinnati, O., make the "Gladiator" Corn Sheller of different sizes.

YALE IRON WORKS, New Haven, Conn., make the "Yale Steam Engine" in various forms, also the "Yale Vertical Mill," a grist mill of novel construction, the merits of which were explained in these pages several months ago.

Bee Notes for January.

BY L. C. ROOT, MOHAWK, N. Y.

Bees wintering in-doors should be left entirely undisturbed as heretofore directed. The hives out of doors should have their roofs or other covering removed during pleasant days, that the sun may shine directly on the hive, to dry up the moisture, and free the hive from frost. A board should be placed before the entrance to keep off the rays of the sun, so that the bees may not be induced to fly. In all operations avoid the least jar, if possible, as here, as well as in-doors, the most perfect quiet is essential to successful wintering.

Questions and Answers.

VENTILATION.—"How much upper and lower ventilation should the box and frame hives have, while in winter quarters, with the temperature at 45°?"—If mats are placed over the frames, they will need no other upward ventilation, Box hives should have an inch hole in the top. An entrance so arranged that it cannot become clogged is sufficient for lower ventilation.

"SHOULD THE FLOOR OF A BEE CELLAR BE MADE OF CEMENT?"—Yes. It is, for several reasons, preferable to any other; and the sides of the cellar should also be cemented as high as the surface of the ground.

"WOULD YOU ADVISE A CONSTANT FIRE IN THE ROOM ABOVE A BEE CELLAR?"—Yes, unless the cellar becomes too warm in consequence.

"CAN LARVÆ SENT FROM ONE TO TWO HUNDRED MILES BY MAIL, BE DEPENDED UPON TO REAR QUEENS FROM?"—If sent under most favorable circumstances, it might prove successful, but I would much prefer larvæ taken from a hive nearer at hand.

"HOW EARLY IN THE SEASON CAN TESTED ITALIAN QUEENS BE PURCHASED?"—As soon as the weather will admit of their being shipped. I would not advise securing them before May in this latitude.

"IS IT BEST TO FEED POOR COLONIES BEFORE COLD WEATHER SETS IN?"—All feeding should be done before cold weather.

About the Microscope.

Plain Instructions about Using It, important to All, especially those Unaccustomed to handling Microscopes.

Among the many thousands who have it already, or will receive the *American Agriculturist* MICROSCOPE, it would not be surprising if a few should fail to derive from it the interest and instruction of which *we know* it to be capable. In deciding to supply our subscribers with the instrument, the difficulties that would be encountered through the inexperience of some of those who would receive it, were foreseen; to meet, and even to anticipate these, we prepared a descriptive circular to go with each instrument. This points out the method of making several convenient appliances, to increase the utility of the Microscope, and points out some of the various uses to which it may be put. *Every Person receiving the Microscope should not fail to go carefully through the six descriptive pages accompanying it, before attempting to use it. The following explanations will be specially valuable to many.*

In our interviews with those who have called at the office for their Microscopes, and in noticing the manner in which they handle them, we find that our descriptive article does not entirely meet the case of those who have never had occasion to use a microscope of any kind, and we find that there are many such, and even those quite unfamiliar with the uses of an ordinary magnifier. It is necessary, then, to give even more elementary directions as to its use, than those given with each instrument.

The Microscope was described in detail, with illustrations, in the Dec. Number of the *American Agriculturist*.

This is for the aid of those entirely inexperienced, and we will suppose that the Microscope comes (as in many cases it will) to an intelligent person who has never happened to see anything of the kind before, and who, if he ever chanced to look through a magnifying glass of any kind, never gave the matter any special thought or attention. He takes the Microscope out of the box, and

He Should First Examine Its Parts.—In the first place there is a *base* of hard rubber, which supports all the rest, and in the center of this base, covering an opening, is a round plate of glass, called the *Stage*. Attached to the base are two metallic *Clips*, or curved springs, and these hold down two *Slides*, or plates, of glass, with a perforated water-proof plate (*cell*) between them. These, the two plates and the piece between them, he may pull out from under the Clips, and put aside for the present. There will then be the base with its glass stage. From the base there arises an upright rod, upon which slide the *glasses* or *lenses*. Of these there are three, joined together, which may be turned about and moved up and down upon the upright, they may be used as one lens, or they may be separated, and each used singly. Between the lowest lens, and the middle one, is a flat plate of hard-rubber, having a round hole in the center. This is called a *diaphragm*, which will be mentioned presently. Engravings showing the Microscope will be found with the general description on page 34. Having noticed all these parts, and seen what the instrument is, the next thing is to

Learn How to Use It.—A microscope is to magnify something, and that something, whatever it may be, is called an *object*. For the present purpose, a little practice, in order to get "the hang" of the instrument; some fine print will answer as well as anything, and is everywhere at hand. The size, or kind of type in which *this* is printed is called "Nonpareil," and some of the same can be found in almost every newspaper. Having found a bit of this size, cut out a bit, say an inch square, place it on the *stage* of the Microscope, slipping it under the spring clips. Set the Microscope on the table at a window where there is full day-light, (not direct sunshine), or if at night where a good light from the lamp will fall *upon* the paper, and not be shaded by the hands or a hat rim. Separate the glasses so that only the *upper*, larger one will be directly over the *object*, which in this case is the scrap of printed paper; turn the other glasses to one side. Now bring the eye near the glass, and look down through it at the print. Perhaps it will be blurred and indistinct. If so, raise the glass, by sliding it upwards. Raise or lower the glass until you find the hight at which the printed letters look the largest, and at the same time the most *clear and distinct*. This will bring the glass near, or quite, to the very top of the upright, as its length is adapted to this. Now you have found the proper *focus* of the upper glass. Observe, that you can, without moving the eye, see 6 or 8 lines of the print, and a corresponding width. The space that can be distinctly seen is called the *field* of the Microscope.

Some, when they look through a glass, put the hand over the eye not in use, and most persons close the eye. With a little practice, the mind learns to concentrate on the work of one eye, and the other takes care of itself.

Having noticed the print, and the imperfect letters, without lowering the glasses, turn away the upper glass, and bring the second one in its place over the *object*, and look at the print as before. Very likely the letters will appear indistinct, and to see them, as clearly as possible, it will be necessary to push the glasses down upon the upright a little. To get the *focus* of this glass, (which is necessarily lower than the first one), we bring it nearer the object. We see that it has a *shorter focus* than the other. It will be seen that the letters look larger, and, with the eye at that distance from the glass where they look the largest and clearest, but 4 or 5 lines of the print can be seen without moving the eye.

Now turn the middle glass away, and put the lowest one in its place. To get a clear view of the letters, this glass must be pushed down still nearer to them, they will look much larger, and only three of the lines can be seen.

By this trial of the three glasses separately, it will be seen that the longer the focus, the less the magnifying power, and the larger the field, or the more can be seen. The higher the magnifying power, the shorter the focus, and the narrower the field—points of importance to keep in mind. In these trials each glass has been used singly.

Let us now put all the glasses together, leaving the *diaphragm* out *at one side*, and use the three as if they were a single glass, putting them evenly over each other. To get the *focus*, so as to see the letters most plainly, the glasses must be pushed down much lower than with either singly—so that the lowest is within half an inch or so of the object. With this *short focus*, we shall expect, according to the principle just stated, to find a smaller field. You can now see distinctly only the letters of a single line. Then with the short focus and narrow field, the magnifying power should be much increased. See how ragged and broken the letters look, and the fibres of the paper are distinctly visible! With the glasses thus placed the letters of only *one line* are plainly seen, and but about three of these letters in the line. But the letters of the line above and below, appear in part, just their ends, and serve to take away the attention from those directly under the glass. Just turn the *diaphragm* into its place, between the lowest and middle glasses. This cuts off the view of the parts of the other letters, and they no longer interfere, while the three letters directly in view, appear much clearer. This then is the use of the diaphragm—to make the field smaller, and to cut off those objects which can not be distinctly examined.

In looking at the printed paper as an *object*, we keep the microscope standing on its base, the light falls *upon* the paper, and passes from that through the glasses to the eye.—We examine it as

An Opaque Object.—And this is the way in which the microscope will be largely used, as in the examination of Seeds, in the study of Flowers and Insects, and for many other purposes. We selected the print as an object to practise with, because it is something that every one can get without trouble, and if not so interesting as some natural objects, every one understands what it is, and with it can learn the handling, or

Manipulation of the Miscroscope. One of the first requisites in the use of this, as of any other microscope, is *patience*. Though quite as important, perhaps, is a real desire to learn whatever the microscope has to tell about an object.

After learning how to handle the microscope with opaque objects, those of another kind may be tried. Many things that one wishes to examine are of such a nature that they allow more or less light to pass *through* them. These are classed as

Transparent Objects, and are seen by *transmitted light*, or light which passes *through* thin substances, through the lenses of the microscope to the eye. It is well to examine most objects first as opaque, and then, if of a kind to allow of it, by transmitted light. Objects of this kind need a quite different handling from the others. Just at this season there are not many such objects that every one can get. Perhaps the wing of a common house-fly is as readily obtained as anything of the kind. In almost every house, a dead or dormant fly may be found in some corner, and its wing will make a pretty object. To examine this, the two glass *slides* are needed, without the waterproof *cell* between them. Clean the slides, neatly pull off the wing of the fly, lay it upon one of the glass sides, place the other gently upon it, and slip the two together under the metal clips, or springs upon the base of the microscope, and it will be held securely in place. To see this, the microscope is to be held up towards the light, which will pass through the glass stage in the base, through the fly's wing and the slides which hold it, and through the lenses of the microscope to the eye. The different glasses may be tried singly and in combination as directed for the printed paper. The same changes in the glasses, whether nearer or further from the object, to arrange the *focus*; the same difference in the size of the *field* and the same (or even greater necessity, for), use of the Diaphragm as before, will be noticed—and we may add, the same *patience* and careful handling will also be needed. In using the three lenses together, there is a

Mechanical Difficulty.—The upright or rod upon which the glasses slide is in the way of the observer. This could not be overcome without at least doubling the cost of the instrument, and as one of the striking features of the microscope is its heretofore unheard of low cost, it was judged best to keep the price low, and submit to this slight inconvenience, which, after a short use, one soon learns to allow for, and does not notice—still, we think it proper to point it out, that it may be in mind when first using the instrument. All this about

The Mere Handling of the instrument seems necessary for those utterly inexperienced—and the examples selected are merely for the purpose of making one acquainted with it. The sheet that accompanies each instrument suggests various objects of interest, and it should be carefully studied through. With a microscope at hand, one soon becomes accustomed to subject a large range of articles to its scrutiny, and it will be found in frequent demand. The glasses of a microscope are often spoken of as

Powers.—A lens with a long focus and broad field, we have shown magnifies less than one with a short focus and small field, and the combination of three, with the shortest focus and most limited field magnifies more than either lens alone. The three lenses together are then the highest power of this Microscope, and the upper lens by itself is the lowest power. It is always well to examine an object with a low power first. This allows more of it to be seen, and one then knows what part of it to try with a higher or the highest power. Those familiar with microscopes, will look upon these detailed and simple instructions as superfluous. They are to such persons, who cannot understand how strange such a simple microscope is to the hundreds who may have never seen—much less tried to handle and use it. To illustrate how little such matters are understood by those who are entirely inexperienced, one friend wrote that he had looked through the instrument in every possible way, and "he could see nothing." This gentleman evidently supposed that the objects to be looked at would be with the microscope, and that, as with a kaleidoscope, the thing was all there and he had only to look in and see a sight. We send out the microscope, in part as an *educational agent*—useful for what it will teach about natural and other objects, but it appears that in some cases its educational influence will begin by making persons acquainted with itself, and the method of using it.—We will hereafter give simple instructions for *preparing* objects.

Building Homes.

Forty-Five Millions of People in our country want some kind of a house to shelter them. At least ten millions of these give considerable thought and attention to the style, comfort, and convenience of the dwelling, in which they eat and sleep, rear the family, and in which is passed all of the time of mothers and daughters, and half the time, more or less, of fathers and sons. Some millions of people spend at least half their lives in toilsome effort to secure their own homes. Very few have the practical architectural skill needful to plan and construct, or have constructed, the best, the most convenient, the most comfortable, and the most eye and taste pleasing dwelling that can be erected with the sum they can devote to this purpose. This fact has led us to endeavor to give in every number of this journal some plan and some suggestions that may help in improving the homes of our readers, and especially aid those who have houses to build. Recognizing in Mr. Reed an architect, who possesses the rare talent of "common sense," we have given this department mainly to his care, and have sent to him most of the contributions from our readers in this line. For three years past he has supplied to nearly every number of this Journal, some house-plan of his own devising, or one made up from the suggestions of contributors. These plans cover a wide range, from the lowliest $300 or $400 unpretentious residence, up to the costly, tasteful mansion. We do not commend all these plans, by any means, yet scarcely one fails to afford some useful new hint or suggestion. Those who have read them from time to time, must have noticed the many good ideas, new and old, which they have presented. The *details* in construction given, and the carefully prepared *estimates* of amount, kind, and cost of materials and labor, are of great practical value. Any one having a dwelling to construct, modify, or improve, would doubtless save ten or a hundred fold their cost, if, before deciding upon a plan, he should procure the past three volumes of this Journal, and *read through* all that Mr. Reed has written, and also what he will hereafter contribute. We hope that within a year to come, Mr. Reed will be able to combine and concentrate into a popular volume of convenient size and price, what has already appeared in these pages. In the meantime, those who want earlier information can obtain the past three Volumes, bound or unbound, if they have them not already. (See Publishers' notice, page 6.) We solicit continued correspondence, plans, notes, queries, etc., to be sent to Mr. Reed, as helps to make his contributions still more valuable, and as much as possible adapt them to meet the wants of the greatest number.

Science Applied to Farming.—XXXVII

Progress of Agricultural Science.—Cheap Fertilizers.

The number (37) of this article reminds me that I have been writing now three years for the *American Agriculturist* on topics connected with Agricultural Chemistry. In this time I have grown to feel, in a sense, acquainted and in sympathy with my readers. The letters they write are from almost every State and Territory in the Union, and some from foreign lands, the talks with those I meet, the keen interest so many express in the science whose simpler details I have tried to tell them about, the enthusiasm with which not a few have reported their success in putting into practice suggestions I have made, and, withal, the words of thanks and cheer that come as well from men whose mien tells of hard and homely toil as from those whose language savors of learning and air of wealth; these all assure me that to begin this the fourth year of my letters to them, no topic will please them more than the wonderful progress of science applied to farming.

Although,

"Science comes but slowly, slowly, creeping on from point to point,"

and though farmers are proverbially conservative, yet agriculture is gradually coming into line with the other arts and industries in the march of modern progress, and making use of its share of the benefits of science. A proof of this, cheering as it is conclusive, is found in the wonderful growth of the Agricultural Experiment Stations. It is only a little over a quarter of a century ago that a few progressive Saxon farmers, seeing what chemistry was doing for other interests, firm in the belief that it would do no less for theirs, their faith confirmed by the examples of Liebig in Germany, Boussingault in France, Lawes and Gilbert in England, and some of their own number at home, but, at the same time, feeling the need of more accurate experimenting than they, as individuals, had the means or the skill to carry on, joined together, and founded, in 1852, in the little village of Mœckern, in Saxony, the first *Farmers' Station for Agricultural Experimenting.* An agricultural society furnished a farm; a private individual and another society contributed the necessary funds, the farm house was turned into a chemical laboratory, the farm supplied what else was needed. A young chemist of promise, the now famous Dr. Wolff, was called to conduct the work, and the Station was an accomplished fact.

The seed thus sown has borne marvellous fruit. The Mœckern Station proved so strikingly useful, that the government came to its aid and added to its revenue. The example proved contagious. Other Stations were started in Saxony, and then in other German States. Governments, agricultural societies, schools, and private individuals, united in founding them and contributing to their support. Soon the idea crossed the boundaries of Germany. The good work begun in France, throve in spite of the regime of Louis Napoleon, and under the Republic promises a successful future. In Austria, Holland, and Russia, like enterprises were undertaken, and are rapidly increasing. Italy, united under the liberal leadership of Victor Emanuel, found this one of the most efficient means of furthering her most important industry, and had, in 1870, one; in 1872, six, and has now sixteen Experiment Stations. Magnificent work in this direction has long been going on in England. Belgium, Switzerland, and Denmark, have joined vigorously in the movement, and, last of all, Spain has fallen into line with a Station started in 1876. There are, to-day, no less than 119 regularly organized Agricultural Experiment Stations in the different countries of Europe. Portugal, Greece, and Turkey, being the only ones without them.

Of these 119 Stations, over one-half have been established in the last six years, and 40 during the last three years. Prussia has 29, all Germany 66, and the other European States 53. Besides these, there are not far from 50 laboratories connected with universities, agricultural schools, or large estates, which, though not technically Experiment Stations, are doing the same kind of work.

It is a suggestive fact that among the earliest means adopted by the Germans after their war with France, to conciliate their newly acquired provinces of Alsace and Loraine, by improving their conditon, were, in accordance with the policy that brought them their great victory, the establishment at Strasburgh, of a University, and at Rufach, of an Agricultural Experiment Station. That a large part of the pecuniary support of these institutions comes from farmers, is proof of their appreciation by practical men. The estimate in which they are held in the scientific world is indicated by the fact that all the larger German universities, and several of those of other European countries, have laboratories and other appliances devoted to agricultural research.

Experiment Stations in the United States are still in their infancy, but promise a brilliant future. Only two have as yet been successfully inaugurated, one in Connecticut, and one in North Carolina. Several of our leading Universities, Agricultural Schools, and Bureaus and Boards of Agriculture, have been doing excellent work in this direction, notably the Bussey Institution of Harvard University, the Georgia Bureau of Agriculture, and various others. As I am informed by persons who have applied in person or by letter for information concerning the organization of the Connecticut Station, efforts, led by prominent agriculturists, are already in progress to secure the establishment of similar institutions in no less than eight other States, and steps are being taken in the same direction in several more.

What is the Cheapest Commercial Fertilizer? is an inquiry that I frequently receive. The most economical fertilizer for a given case is that which supplies, in the best forms, and at the lowest cost, the plant food which the crop needs and the soil fails to furnish. The requirements of different soils and crops are of course varied. In itself considered, that commercial fertilizer is the cheapest which furnishes the valuable ingredients at the lowest rates. Our State Agricultural Society had this subject canvassed with unusual thoroughness by offering at their fair a year ago last fall, prizes for those

"fertilizers which, as actually sold in the State, are found, on comparison of the selling price with the actual composition as shown by the averages of the analyses made at the State Agricultural Experiment Station, to furnish the valuable ingredients in the best forms and at the lowest prices per pound."

The first prize, a Gold Medal, offered "for the Fertilizer which furnishes the largest quantity, at the lowest price per pound, of Nitrogen, Phosphoric Acid and Potash," was given to *No. 1 Peruvian Guano, Rectified*, manufactured by Hobson, Hurtado & Co., and sold by them and by C. V. Mapes. In the Judges' report, which was based, not

"upon the specimens exhibited by manufacturers or sellers at the State Fair, but upon the character of the Fertilizers actually sold to the Farmers of Connecticut, as shown by analyses of a large number of samples collected from various places where they were sold," they "take occasion to say that we deem the plan adopted in the preparation and sale of Peruvian guanos, particularly the 'Rectified' and 'Guaranteed' brands, worthy of special commendation, in that the prices at which they are sold are based upon the analyses as guaranteed upon each package, each pound of the valuable ingredients being rated at a certain price, instead of the usual way of selling by the gross weight irrespective of the relative proportions of the valuable and the comparatively worthless ingredients. It is both fortunate and suggestive that the plan, which is the most rational and just one for the sale of commercial fertilizers, should have been adopted for an article of such leading importance in our agriculture."

The prize for ammoniated superphosphates was awarded to Russel Coe; that for superphosphates without nitrogen, "plain superphosphates," to H. J. Baker & Bro., and that for fish manures to the Quinnipiac Fertilizer Co. The Stockbridge and Matfield Fertilizers received honorable mention as being what they were claimed to be. Since this report was made, a good many more fertilizers have been analyzed at our laboratory. Indeed, during a little over two years past not far from 300 samples of commercial fertilizers, comprising nearly all of the more important kinds sold in this part of the country, have come to my hands for analysis. Among these were 15 samples of Peruvian guano. The composition of these averaged, on the whole, better than was claimed. Taking into account both quality and price, no other fertilizers have been seen at our laboratory, which, as a class, taking into account both quality and price, furnish the valuable ingredients of plant food so cheaply as Peruvian guano.

W. O. ATWATER,
Wesleyan University, Middletown, Conn.

Ogden Farm Papers.—No. 95.

BY GEORGE E. WARING, JR.

Whatever may be the future experience of the Ogden Farm enterprise, of one thing I am quite sure: that I shall have no duty in connection with it so distasteful as the writing of this paper. Henceforth—having learned wisdom by experience—I shall make no more promises. In the enthusiastic anticipation of a brilliant success, I promised, eight years ago, to tell the whole story of my farming, with full and entire frankness. I have left myself no loophole for escape, and must be as good as my

word. Moral: Be careful what you promise, that you may escape the need for doing what you would gladly avoid.

I have thrown my only sheet anchors to windward, in giving an account of my successes in the making and selling of butter, and in the breeding and selling of Jersey cattle. However good these are, they will not keep me from drifting on to the lee shore. Wind and tide set too strong that way, and I can only own up to a most ignominious failure in attempting to make a profitable operation of reclaiming a worn-out farm, by the application of the best modern improvements.

There is one office to be performed by this story, which will be of value to a very large class who are known as "gentleman farmers," for they are subject to the same temptation which undid me—the temptation that comes of having too much money. Mr. Tyler, my backer, entered into the scheme with a really growing enthusiasm, and strewed my road with roses. Year after year, his only anxiety seemed to be that not enough would be done. No improvement could be suggested—by my tongue or by his own fancy—which did not produce, without stint, what ever money the improvement might need. His boundless liberality, from the very start, has been equalled only by his entire kindness, and manliness in accepting the final and direful result. My one great consolation, in reviewing the whole matter, is the feeling that the cordial personal relations which have always existed between us, have suffered nothing from the strain which our failure has put upon them.

I have given ten years' services for ten years' most valuable experience; he has given a great deal of money for temporary hopes and satisfaction, followed by an assurance of failure and disappointment. The account is not even—nor can I make it so, however much I may yet accomplish for his son and successor.

To come down to details, I give the following figures:

Our total outlay has been	$125,017 18
Divided as follows:	
Farm and Buildings	30,202 29
Labor	16,892 72
Implements	5,096 08
House Expenses	9,102 06
General Expenses	8,978 38
Feed	28,103 46
Manure	2,144 32
Seeds	513 29
Books	318 58
Live Stock	20,551 05
Produce Sold	3,114 85
Against this we have the following credits, amounting in all to	106,952 62
Divided as follows:	
Farm and Buildings, (estimated value),	25,000 00
Live Stock Sales	32,531 80
Live Stock on hand, (estimated value),	13,399 00
Produce Sold	23,321 82
Implements on hand, (estimated value),	1,500 00
Produce on hand " "	1,200 00
Good-will	10,000 00

This is the best estimate that I can possibly squeeze out, and it shows a deficiency of $18,024.56, to say nothing of a very large amount of interest, which, on the whole, it would not be fair to include; for the naked fact is that, so far as money has been lost, it was lost when it was spent, and there would be no more reason in calculating interest for the period of our enterprise, than for calculating it henceforth forever. The case is bad enough as it stands, and it is not worth while to aggravate it by considering money which would have been paid from profits if profits had been realized.

Concerning the estimated assets given above, there is only this to be said:—The farm and buildings have *cost* more than they are appraised at, and there has never been $500 spent on any ornamental improvement. We did spend some $2,000 in an extension of the barn, and in a poultry-house, which have not much practical value. The land was considered cheap at what it cost, $7,738. Its draining could now be done for about $5,000. The buildings would now cost (the necessary ones, including the very fine barn) at least $9,000, and the removing of interior fences, road-making, grading, etc., would be cheap at $1,500. This leaves $1,772 to represent the increased fertility of the land due to the cultivation and seeding down that it has received, and to the enormous amount of manure added to it by the consumption upon it of all the crops it has grown for 10 years, and of our $25,000 worth of purchased feed. The value of the live stock—as was stated in last month's paper—is made at fair selling-rates, and it could be closed out at the price within a year, paying its way in the meantime. The item of implements I might fairly place much higher. Produce on hand, (Sept 6), I lumped at the equivalent of 60 tons of hay at $20 per ton—it amounted to more than that.

The remaining item, "good-will," I have put at $10,000. I consider it worth that, under the most unfavorable circumstances. If I owned the farm to-day, and intended to follow the same line of business, I would not sell our reputation for a larger sum, for it would take years of hard work and volumes of successful writing, to replace it. A new comer, unknown as a dairyman, and as a breeder of Jerseys, could well afford to pay more than $10,000 to be placed in the present position of "Ogden Farm," in the estimation of the public. On the whole, I consider my column of credits—footing up $106,952.62—to be fairly constructed.

The practical question in connection with the whole matter is, whether it would now be possible to take up the enterprise—farm, stock, and good-will—and carry it on in such a way as to make a profit on this large valuation. As an ordinary farming operation, it certainly would not be possible. It would call for a *net* revenue, over all charges of every kind, of about $6,500 per annum. But it need not be regarded as an ordinary farming operation. The aim should be to extend the business of buying and selling, and breeding Jerseys to the utmost capacity, not only of our 73 acres, but of such land as we could hire in the neighborhood, until we were in a position to supply any number of animals that might be called for by the constantly increasing demand. The utmost practicable extension should also be given to the production of butter, and its sale at a high price. Managed in this way, I think that a business might be done which would warrant the use of even a much larger capital; and it is to some such system as this that we must now look for success. My experience as Secretary of the American Jersey Cattle Club, enables me to form an estimate of the extent of the business. The "transfers of ownership" average about 2,000 animals per annum; and probably three-quarters of this number are original sales, the remainder being only records of old transactions. Most of these sales are probably made at prices at which it would not pay us to compete for them, but the demand is already very large for really first-class animals at profitable prices, and it is constantly increasing. There is a good field now, and it is steadily extending, for any breeder of first-rate reputation.

However, let us not speculate as to what may be done in the future. It will be better to wait, and tell in the future what has been done in the past—only let it be borne in mind that my *promising* days are over. If I make a success, I shall probably be willing to brag about it; if I make another failure, my pen will be otherwise engaged.

I have hinted above that "gentleman farmers" may find food for reflection in this account. I know the class pretty well. They have made their mark in all parts of New England and the Atlantic slope of the Middle States. Expensive, and often fanciful farm buildings, walls built for the sake of getting rid of stone, artificial land founded on piles of artificial rock-work, expensively drained swamps, which refuse to stay drained, and all manner of cash-sepulture, constitute their sign-manual, and one need only drive through any hundred miles of the region described, to become amazed at the vast sums of money—earned in other ways—which have been, and still are being, irretrievably lost in the attempt to gain credit and satisfaction in "Improved Agriculture."

We hear of this man, and of that, who is carrying on his fine farm "on strict business principles," and who is making a great success. Basing my belief on my experience, I fancy that their successes, *as a whole*, will not often bear the searching scrutiny of the slate and pencil. Success in *items* is frequent. The bare statement that we started only ten years ago, with a wretchedly poor little farm, with no reputation, and with no experience in breeding or in dairying, and have sold our $20,000 worth of butter, and have made a profit of over $25,000 on our live stock, would mark us as most successful farmers. If we had kept no account of our outgoes, we should fancy ourselves champion Improved Agriculturists, whose business principles have been of the strictest and most successful sort. But we did keep accounts of everything, and they are here spread out before the triumphant gaze of the average reader. The rules of the English telegraph service will not allow a man, in a despatch of his own writing, even to call himself a "duffer." Let me take advantage of the amenities of the agricultural press, and refrain from naming my own obvious qualities. The impression under which I am now laboring is, that I cannot, in any system of strict terminology, be designated as an entire success.

At the same time, I have enough fight left in me yet to wish that I might measure trial-balances with some who may fancy themselves my betters. Look at my labor account; nearly $1,700 a year—added to a charge for board of over $900 a year—yet everything like draining, wall moving, road making, etc., is covered by the item "Farm and Buildings." I have never hired men because times were hard, and they needed help; I have never paid high wages; and I have always had long hours. I have done no fancy work of any sort—have even been called untidy, and have acknowledged it. In spite of all this, the whole of the large sum made on live stock, has gone this road. Look again at the amount spent for "feed," (including hired pasture, but none of the products of our own soil). It has swamped our total butter sales, and more than enough more to pay the original cost of the farm. Then, too, that horrible sum on "General Expenses," little odds and ends like postage, and horse-shoeing, and harness mending, and all manner of extras, it has run up to a sum nearly equal to the cost of boarding hands whose wages were more than $16,000. The necessary conclusion seems to me to be that the steady and inevitable out-flow of money required in carrying on a farm on anything approaching a "grand" scale, is more than the business can stand, even with the advantage of exceptionally high prices. Such farming as we have undertaken can not pay, unless it is done on a much larger or on a much smaller scale—small enough for the farmer and his family to do most of the work, or large enough for the commercial element to support the industrial element.

That Ogden Farm offers at least equally valuable hints to the farmer who carries on his own place very largely with his own labor, and who has only sufficient capital to carry it on in a small and careful way, I think no one who has followed its operations, as detailed in these papers for eight years past, will question. We seem to have made it very clear that to manage a small farm as one would manage a large factory, is not profitable. But, incidentally, there appears ample evidence that the small farmer may profit very much by an improvement of his processes, and by getting a reputation for producing only goods of the best quality.

We have had exceptional advantages, and have been able to get higher prices than a small, single-handed farmer could get under ordinary conditions—but, thus far, our advantages have cost more than they have come to. Every butter-making farmer in the country, even if he keeps but a half dozen cows, may, if he will keep good Jerseys, or breed to a good Jersey bull, and raise his best heifer calves, soon put himself in a position to get an increased price on his butter, and this increase will be all profit. If he improves the quality of his cows by crossing with Jersey blood, he will be able to get an extra price for his surplus, if sold only to his own neighbors. If he breeds a good quality of Registered Stock, he can depend on a good sale for his increase, at very remunerative prices. I instance these two items because they are the ones in which I have had experience. The same result would follow equal care in any other kind of stock

raising—or in seed raising. To do what is done in the best way that can be afforded, and to send to market the very best class of goods that can be produced, seems to me the means by which good and prudent farming is to be made profitable.

I have a theory that if I had begun with a good farm (costing much more at the start) I should have shown a better result—but there is no use now in thinking of "what might have been." The ease with which I could get money, and the confidence I reposed in "strict business principles," would probably have swamped me in the Garden of Eden.

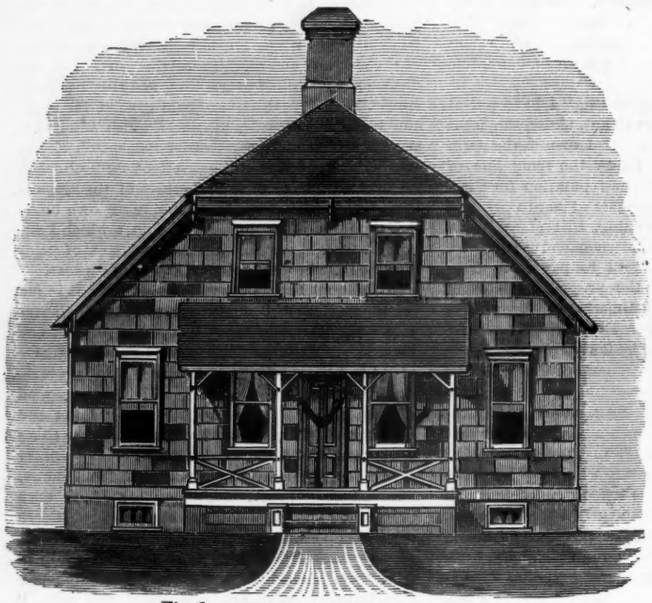


Fig. 1.—ELEVATION OF FRONT OF HOUSE.

Country House, Costing $750 to $1,050.

BY S. B. REED, ARCHITECT, CORONA, LONG ISLAND, N. Y.

These plans represent a commodious dwelling house, constructed with especial regard for economy and utility, and they will be appreciated by those desiring to provide a comfortable, permanent shelter for home by the use of limited means.... **Elevation,** (fig. 1.)—In preparing plans for "low-priced" houses, the simplest outlines are indicated. Having to combine usefulness and small outlay, there can be no latitude for architectural display, beyond mere matters of accommodation and completeness. The Exterior of this example fairly expresses its domestic purpose. The breadth

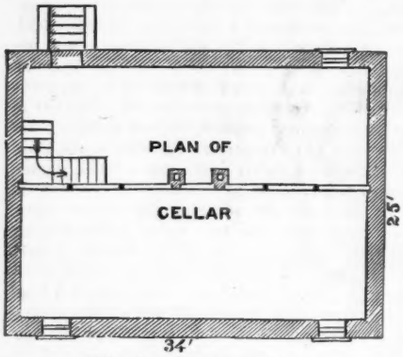


Fig. 2.—PLAN OF CELLAR.

of the front, the preponderance of horizontal lines, and the hooded roof, are each indicative of strength, and suggest its adaptation to rural situations. The satisfactory appearance of this house will greatly depend on its location. The best results would be obtained by placing it on a slight knoll, giving it additional apparent altitude. This would prevent its being obscured by shrubbery and trees, which are indispensable accompaniments of a properly developed homestead.... **Cellar,** (fig. 2.)—Hight 6½ feet. It has three windows, an outside entrance, and stairway leading to the kitchen above.... **First Story,** (fig. 3.)—Hight of ceiling 10 feet. The accommodations, consisting of five rooms, a pantry, and two closets, are adapted to a good sized family. The Parlor and Kitchen are the principal rooms, and occupy the middle portion, their sides being protected by other rooms, and, having the fire-place between them, they are easily warmed. The device for heating *described last month*, would serve admirably in this house. Two Bed-rooms adjoin the parlor. Many might choose to have *double* doors entering the bed-rooms, to allow all three to be used together occasionally. This would not preclude the use of the smaller ones as bed-rooms, or, if preferred, as a sewing-room and a library. The Kitchen is the largest room, with doors leading to the pantry, bed-room, parlor, stair-way, and the rear entrance. The outside or entrance doors may be protected in severe seasons by storm-doors hung to open outward, with loose joint butts to allow of their ready removal. The rear veranda is similar to the front one shown on the elevation.... **Second Story,** (fig. 4.)—The front portion only is finished, with ceilings 8 feet high, and is divided into two chambers and four closets. The rear portion is left unfinished to be used as an open garret. The space above the ceiling of the finished portion may be floored over with boards, to serve for storage of quilting-frame, trunks, etc.... **Construction.**—The excavations for the cellar are 4 feet deep. The foundation walls are of broken stone, laid in mortar, and show 2 feet above the earth grade. A strong girder resting on large posts, or columns of stone or brick, supports the center of the building. In setting the girder, it should be elevated from ½ to ¾ of an inch in the center, rising gradually from each end, to allow for settling, which invariably occurs from shrinkage of the interior frame work. The timber for the frame work is indicated in the estimates below, and is substantially framed together. All the outside studding is *halved* over the principal timbers, to prevent vertical shrinkage from affecting the exterior covering of the side walls. The exterior covering is of lath and plaster, as follows: all cornices and other dressings, and the roof should first be completed—and all window and door frames set and cased. The outside frame should then be thoroughly lathed outside and inside. *All this is to prevent jarring or pounding on these parts during the application, or setting of the plaster.* The plaster is made in the usual manner of fresh burned lime and sharp sand—with half a bushel of hair to each barrel of lime used, and allowed to lay two weeks to insure a thorough slaking and permeation of the lime. It is then applied in two coats—the first a "scratch," the second a "browning." The surface is floated with a "darby," (not trowelled.) After having stood a sufficient time to become dry, the whole is covered with a preparation called "Stereate of Lime," using an ordinary whitewash brush. The formula for making this stereate of lime, (known only to a few who have treated it as a secret), is here published for the first time, and will be understood by those familiar with the operation, and of slaking lime. The ingredients are simply fresh burned finishing lime, using the lumps only, and unrendered beef suet. It is necessary that these parts be kept in lively motion while dissolving, or they will be entirely

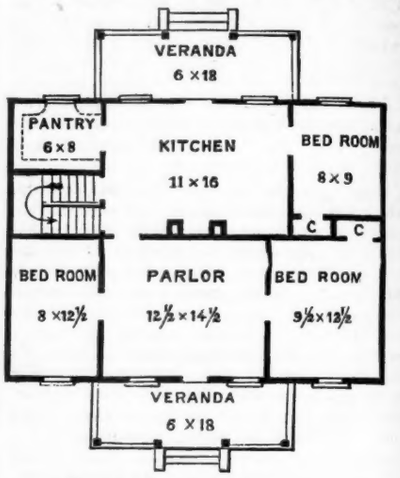


Fig. 3.—PLAN OF FIRST FLOOR.

destroyed by "burning." The usual process is to sink a large barrel, having an open end, two feet in the ground, pounding the earth around to make it firm. An upright piece, 4 inches in diameter, and 6 feet long, is set upright in the centre of the barrel, and held in position by cleats at the bottom and top, leaving the upright free to turn. Arms are put through the upright within the barrel, and a cross-bar or lever is attached to the upper end—the whole making an apparatus similar to a "clay-mill." One bushel of lime, 20 pounds of suet, (chopped fine), and a barrel of boiling water are provided—and while one works the "mill," another feeds alternately lime, suet, and hot water. This quantity of material, costing about $2, will make a full barrel of the preparation. Any desired shade may be afterwards given by adding stainers. This mixture is applied while hot—two coats being necessary to insure a thorough covering. This will also be found a valuable preparation for covering exterior brick or concrete work. It is impervious to water, and will outlast any of the paints prepared for such purpose. All other information concern-

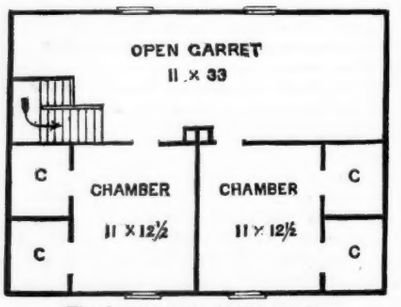


Fig. 4.—PLAN OF SECOND FLOOR.

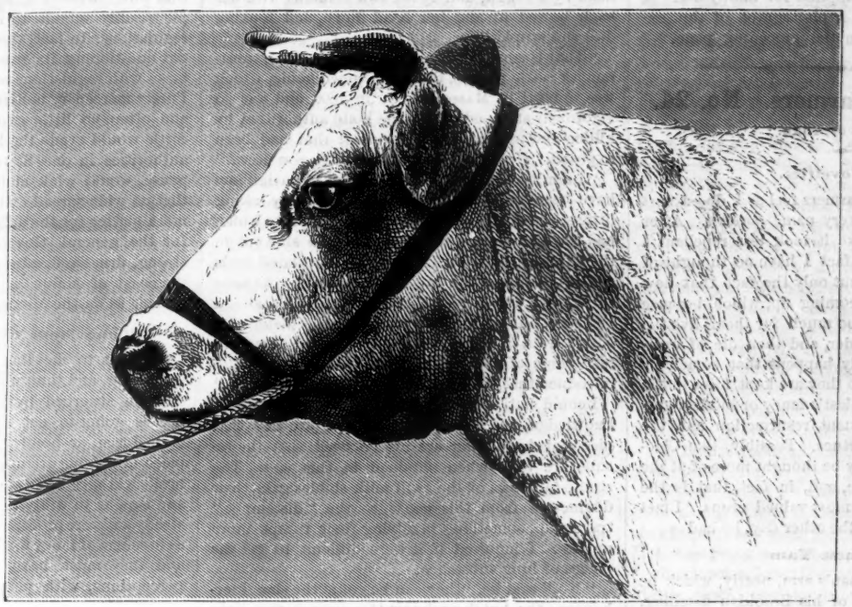
ing the finish of this house may be inferred upon a careful study of the following estimates:

Estimate, cost of materials and labor:

95 yards excavation, at 20 cents per yard		$ 19.00
1062 feet stone foundation, at 15 cents per foot		159.30
24 feet stone steps and coping, at 28 cents per foot		6.72
2000 bricks in chimneys, laid, at $12 per M		24.00
517 yards plastering, inside, at 25 cents per yard		129.25
130 do. do. outside, at 30 cents per yard		39.00
1850 feet of timber, at $15 per M		27.75
2 sills, 8x8 in. 34 feet long.	2 plates, 4x6 in. 25 feet long.	
2 sills, 8x8 in. 25 feet long.	2 perlines, 8x8 in. 25 feet long.	
1 girder, 4x8 in. 32 ft. long.	2 perlines, 4x6 in. 18 feet long.	
4 posts, 4x7 in. 11 feet long.	100 beams, 1¼x8 in. 13 ft. l'g.	
8 ties, 8x6 in. 34 feet long.		
300 wall strips, at 13c. each		39.00
4 locust posts, at 30c. each		1.20
190 flooring, at 20c. each		38.00
216 shingling laths, at 6c. each		12.96
39 bunches shingles, at $1.40 per bunch		54.60
3 cellar windows, at $3, $9; 12 plain do. at $7, $84		93.00
17 doors, at $4 ea., $68; 2 verandas, $50 ea., $100		168.00
Stairs, $20; cornice materials, $18		38.00
Closet finish & base, $15; Nails, $12; Cartage, $20		47.00
Painting, $40; Carpenter's labor, $100		140.00
Incidentals		13.22
Total cost, complete		**$1,050.00**
Omitting Cellar and Verandas would save		**300.00**
Total, after deductions		**$750.00**

Head of a Shorthorn Cow.

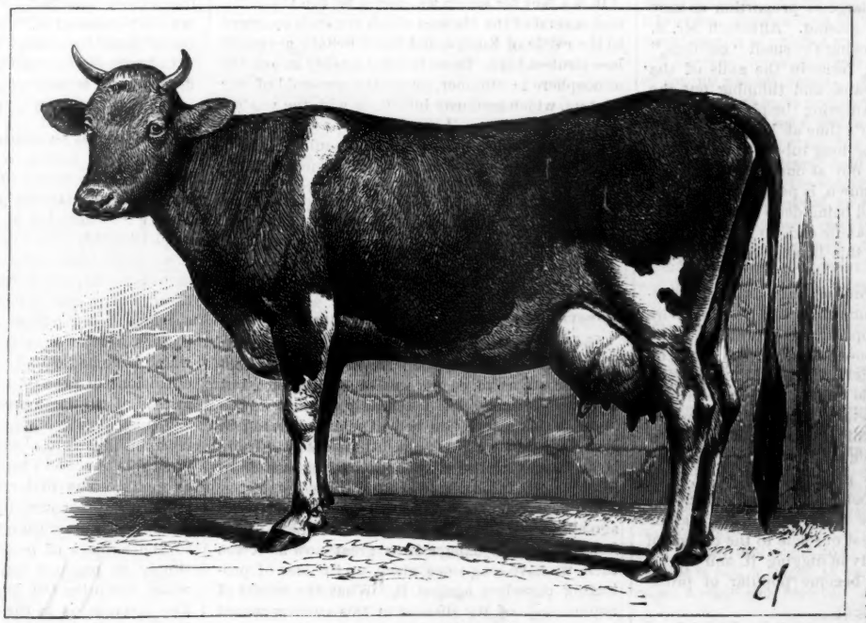
We give herewith an engraving of a fine portrait of a head of a model Shorthorn cow. This is "Duchess Gwynne, 2d," one of the choice members of the finely-selected and highly-bred herd of Earl Bective, of Underley Park, England. This cow is 8 years old, and has borne 6 calves. Her dam was sold in 1866 for $315; in 1868, she was re-sold for precisely thrice this sum. In 1874, the dam was again sold for the sum of $2,227.50. Two years later, her cow-calf was sold for $2,650. The cow, whose head we here reproduce from the "Agricultural Gazette" (London), is a finely-formed animal, and an excellent feeder and milker. Her reputation as a breeder is such that three of her calves realized at the last Underley sale, $6,250. The cow is, therefore, a very valuable piece of property to her owner. The head is a model, and shows the animal to be of the temperament that we look for in a good feeder and milker. There is about it the true character which belongs to her Duchess lineage, and the air of high breeding which is so attractive in the show or the sale ring. One can readily excuse a wealthy purchaser, who is attracted by these qualities, for bidding what we may truly call extravagant prices for such animals. In reality, the prices given are extravagant when considered under ordinary circumstances, but when considered as value given for scarce and desirable articles of luxury, comparable with fine and rare works of art, the extravagance no longer exists. These animals are, in reality, works of art, because they are produced by the most skillful and artistic breeders for the purpose of luxurious enjoyment, rather than for ordinary uses as producers of milk and butter, or beef. In such a case, the rules regulating ordinary intrinsic values do not hold good, and we should be careful to distinguish between the circumstances surrounding these fashionable families of Shorthorns, and those relating to ordinary serviceable animals, when we feel disposed to criticise the actions of purchasers of the former. In relation to this subject, it is, perhaps, pertinent to refer to the present depressed condition of the Shorthorn market. It would be a matter for regret were this valuable interest to be unduly depressed. To some extent, the present unsatisfactory condition is due to an unavoidable reaction from the excessive speculative activity of a few years ago. Speculation always injures whatever it may touch, in this way, but it is certain that out of the present condition there will grow a healthy legitimate business, in which there will be money for all concerned; for the breeders of high-bred families of unusual value, and sought by wealthy purchasers; for the breeder of the plainer and more useful animals, for farmers and graziers' use; and for the farmers and graziers who buy breeding animals on their merits, rather than for those of their ancestors of several generations back. A farmer or grazier can well afford to give for a yearling for breeding purposes the sum which it would bring for beef when mature, or for milk and butter when a cow; and this price would pay the breeder very handsomely. The so-called fashionable animals will always bring high, and, when judged by an ordinary standard, extravagant prices; but so long as speculation does not run wild in consequence, there can be no objection to the enjoyment, by men of wealth and fine taste, of the satisfaction which comes from the possession of animals which are attractive for their beauty, and costly from their scarcity and expensive breeding. The business of breeding Shorthorns, when thus divided into two distinct branches, and kept thus separated, is one that has a certain future before it, and will undoubtedly increase in extent and importance. There is no reason why confidence should be withdrawn from it, because in the process of the necessary separation above indicated, it is under a temporary cloud. The production of meat is destined, without any doubt, to be immensely extended, as the great western plains become covered with herds, and as the farms east of those become feeding places for finishing off the grass-raised cattle into mature fat beef, or into breeding farms for supplying pure-bred bulls to the graziers; and as all these together become purveyors to the needy people of Europe, as well as to our own rapidly-increasing population. The present nucleus from which the greater part of our future beef, and much of our milk, butter, and cheese, must come, exists in our pure Shorthorn herds, and to these we must look for the greater part of the means we shall use for the future development of stock-growing. With such a future in prospect, the Shorthorn interest can not long remain depressed. Intending buyers could have no more favorable opportunity than the present.



HEAD OF SHORTHORN COW "DUCHESS GWYNNE, 2D."

A Remarkable Jersey Cow.

Authentic records of the performances of good cows are valuable. They not only show what may be aimed at by breeders, and farmers, who should keep only the best animals, and breed from these with the greatest care, but such records show very clearly the vast difference there is between good cows and the common ones generally kept, and how much more profitable the best cows are than others. There have been recorded from time to time, in the *American Agriculturist*, the products of a number of more than usually good cows, and we have seen these records gathered carefully by agricultural writers as evidence of the value to farmers of such excellent animals. These records, therefore, have a certain value, and as from time to time we are authentically informed of the performances of extra good cows, we gladly publish them as information of both present and future interest.



JERSEY COW "ABBIE."

We have been favored by Mr. Harvey Newton, of Southville, Mass., with a record of his Jersey cow "Abbie," from April 17th, 1876, to March, 1877, during which time she yielded 10,070 lbs. of milk, as follows: April 17th to 30th, 417 lbs.; May, 1,365 lbs.; June, 1,406 lbs.; July, 1,247 lbs.; Aug.,

1,155 lbs.; Sept., 992 lbs.; Oct., 907 lbs.; Nov., 794 lbs.; Dec., 788 lbs.; Jan., 1877, 707 lbs.; Feb., 551 lbs.; March, 371 lbs. Total, 10,700 lbs. On April 15, 1877, she calved again. The butter produced within the year was 486 lbs.; besides which, milk and cream were supplied for family use. A portrait engraved from a photograph of this excellent cow is given on the preceding page.

Among the Farmers.—No. 24.

BY ONE OF THEM.

Old Novelties.

I wonder how many farmers feel as I do—a sort of repugnance to the very name *novelties*. After writing it above, to make it look less repellant I wrote *old* before it. In fact I have no thought of discussing new things, but only the fact that new things are all the time coming up, which, because their advocates claim too much for them, live the life of a nine-days'-wonder, and then die of overexaltation. It generally happens that somebody has faith in them, and so they are kept alive in the warmth of some enthusiast's fancy or kitchen garden, waiting a subsequent resurrection and the recognition of their virtues. Possibly, like Cleopatra's Needle, they may be thought more of at the antipodes than at home, and, in fact, that is the way with many of our most valued crops. I met with Mr. James Salter, the other day, he had

A Chinese Yam

as large and long as a man's arm, nearly, which he had raised in the yard of his Brooklyn dwelling. He raises these yams regularly, and has done so ever since the plant was brought out with such a flourish of trumpets by Prince, of Flushing, fully 20 years ago. They furnish an abundant quantity of excellent food, of which the children are very fond—preferring it decidedly to any preparation of common potatoes. They are cooked by simply boiling—and of this they require very little before they become mealy and delicate, so that it is not alone the children who are fond of them. Mr. Salter plants some every year, and they occupy the ground two years, at least, then, by digging a trench by the side of the row, the tubers are taken out, and are long and large in proportion as they have been long in the ground. Although Mr. S. makes a planting by sowing the small "bulblets," or little tubers, which form in the axils of the leaves, in rows like beans, and thinning out the row subsequently, by removing the plants if necessary, yet he saves a year's time at least, by cutting off the upper end of the long tubers when he digs them, and setting that out at once. The form of the tubers, as is well known, is peculiar. They are club-shaped, the big end being deep in the ground, and the long, slender handle end, so to speak, being at the surface, and this is what is cut off and replanted.

The vine of the Chinese Yam is highly ornamental, it being somewhat like the Madeira vine, which is so popular, but prettier. Mr. S. has a farm in Connecticut, where more or less of it is regularly raised. Most of the best seed stores furnish the little tubers, and any one may readily add a new vegetable, the raising of which will give very little trouble, to the list of those now cultivated, and of which we may become exceedingly fond when it is generally cultivated. [By "raising," our correspondent evidently does not mean the lifting of the roots, or "tubers," as he calls them. The greatest obstacle to the culture of the plant is the difficulty in digging it, and on this account it can never become popular or profitable.—ED.]

Lung Murrain among Long Island and New Jersey Cows.

It has been a well known fact that pleuro-pneumonia has been lurking in the "swill milk" stables of Long Island and New Jersey for years, and that now and then it escapes from its legitimate haunts and decimates the herds in the surrounding country, or in circumscribed districts. One of my friends among the farmers of the Island, called today to ask what he could do to protect his herd of cows from the "distemper."

"Distemper," said I, "'cow distemper,' what is that?"

"The milkmen call it so," said he. "It shows itself by a cough, and by the cow standing with her back bowed up and her head down, and looking dull and stupid."

"That is something terribly like the lung murrain, or cattle plague, the pleuro-pneumonia, which was so fatal in Massachusetts in 1860, and was so vigorously stamped out by the State authorities, by killing and paying for every animal that had been exposed. How near is the disease to you now?"

"I don't know how near it is, but my neighbors have been inoculating their cows for it, by taking little slices of the lung substance of a cow which had the disease, and inserting them in slits cut in the tails of their cows, binding the inoculated ends of the tails up with a rag for a few days. As soon as it takes, the rags are taken off, and it makes a bad sore, but the cows do not have the distemper. Now I want to know if it will not do just as well to take some of the matter from these wounds, and introduce that, as to get a piece of diseased lung."

I could not answer that question from previous knowledge, but imagine that from the fact that pieces of fresh lung are always used, that the results are best when obtained in this way. The stump-tail cows of the swill milk stables gain their distinction from this cause, as the "distemper" travels up, sometimes involving their rumps more or less. I inquired if it were difficult to get the pieces of lung substance.

"No," said he, "they can be got at the slaughter-houses; the butchers know the animals that have the disease."

"What?" said I, "is it possible that this sick beef is killed and marketed?"

"Certainly. When an animal gets the distemper her owner turns her off before she gets it very bad."

In view of these facts do we not need

A Veterinary Inspector of Live and Dead Meat?

No doubt quantities of unhealthy and even badly diseased meat is sold annually in our large cities, and particularly in the group of cities around and including New York.

It is a fact for which we cannot be too thankful, that several of the diseases which are such scourges to the cattle of Europe and Great Britain, are much less virulent here. There is some quality in our dry atmosphere in summer, or in the zero-cold of our winters, which seriously interferes with the vitality of this very disease (Lung murrain) as also of the "Foot-and-Mouth" disease. This should not, however, lead us to be less careful, for some day a disease might be imported which would sweep off our herds as the lung murrain did those of south Africa, where it was introduced in 1855, and in two years had traveled 1,300 miles, literally sweeping the immense wealth of neat cattle off the face of the earth. We need a

Governmental Inspection of Incoming Cattle.

The people are deceived by certain requirements of the Government. Orders are issued to our Consuls abroad, as to certificates of health, etc., but so far as I know, and I certainly am in a way to know, a sick animal can be just as easily landed in New York as a well one, and I think easier. There is no barrier to the introduction of disease from foreign ports into the ports of the United States.

We had a wholesome scare two or three years ago about the Rinderpest, but like soldiers under fire, though the danger is as great now as it was then, we have long since given up the idea of protecting ourselves against it. What the results of an outbreak of the disease in this country would be, no one can tell. Like a fire in the woods, which now laps up the dry leaves, and stays only in some rotten stump or hollow tree, and again sweeps away miles of heavy timber, leaving nothing but charred stems and drifts of ashes, the coming disease may go by doing us little damage, or it may well nigh annihilate our herds. Are we ready for the experiment?

Hitherto the American system has left the protection of the people against the introduction of disease by water, to the several States which establish more or less efficient quarantine regulations at their various ports. The natural dread of "the pestilence which walketh in darkness, and the destruction which wasteth at noon-day," is such that people readily submit to any reasonable quarantine regulations. In fact, they submit to anything without questioning its reasonableness. It would not be so with regulations affecting the trade in cattle. Purely mercenary motives would be roused in men, and often no little expense incurred. Owners of cattle would evade the laws if they could, and the authorities in one State or another, to avoid expense, would wink at infractions, trusting to luck that no wide-spread evil would be the result. It is not a matter for the different States, but clearly one for the general Government to control with a strong, firm hand, administering the same laws on the coast of Maine as on that of Florida—on the Canada as on the Mexican frontier.

Money Made by Poultry Keeping.

It seems to me that the interest in poultry is increasing, and that more poultry keepers, instead of being absorbed by the insane idea that every one is going to get rich by selling fancy eggs at $3 a dozen, or poultry ready to lay, at $3 to $5 a piece, are giving attention to raising eggs in winter, broilers in spring and summer, fat pullets in autumn, and capons in winter. In these products there is steady and sure profit. Of course a few will succeed as breeders of fancy fowls, but the number is limited, and they must have good judgment and keen perceptions, with persistence and perseverance.

Capon Raising

is a profitable branch of poultry culture which is not likely to be over done. The art of caponizing is easily learned. Mr. Rushmore, President of the Eastern New York Poultry Society, learned to practise it a few years ago, and last year raised a large number of these delicious fowls. He informed me that he lost not more than two per cent, and that there is no need of losing any if the birds are empty of food, and the operator has sufficient light to do his work well. Good fat capons will bring fifty per cent more per pound than other fowls will sell for, and very large capons much more than that. The conditions for success are the possession of hens of a large breed, and the use of judicious crosses to produce quick growth, with hardines of constitution and aptitude to lay on flesh. There is no doubt, I suppose, in regard to the

Advantage of Cross Breeding.

What breeds to cross, is a problem which has not yet been solved. I was much interested in learning of a series of experiments which Mr. Rushmore is planning to carry out next spring. They were suggested in a measure by an experiment tried this year with marked results. Asiatic fowls were bred pure, and also mated with Plymouth Rocks, which itself is a recognized cross-breed, but an established one. The result is that the cross-breed pullets and cockerels are several pounds heavier than the Asiatic pure bred ones, which have had equally good care, feed and other conditions of growth. Those cross-bred chickens instead of making a great growth of stilts at first, and subsequently laying a modicum of flesh and fat upon them, are always ready for the table, and profitable to send to market, after they are as large as quails. The first cross makes, as a rule, the greatest improvement upon the parent breeds, and a number of practical questions come up, in regard to the subject of poultry raising, with the view simply to produce the largest amount of meat which will bring the highest price in the market. For instance, as in the crossing of Brahmas and Plymouth Rocks, or any Asiatics with games, should the hens be of the larger breed, or the reverse? Which breeds crossed will develop the greatest early maturity? The greatest weight at the most profitable ages? The greatest weight and plumpness at the best market periods? Which make the best capons? There have been a good many half-made efforts to solve these and kindred problems, and I am glad to know that Mr. Rush-

more proposes to conduct some thoroughly well considered experiments on a sufficiently large scale to give data of substantial value.

Talks on Farm Crops.—No. 11.

By the Author of "Walks and Talks on the Farm," "Harris on the Pig," etc.

I have always had a prejudice against corn-fodder. I thought it was too bulky a crop in proportion to its nutriment. If fed green, we had to cut and draw 20 tons of material to get 3 tons of dry fodder of far less value than clover hay. I thought so long as we continued to plow under clover for manure, there was little sense or economy in raising a poorer article for food. But we find it is not always an easy matter to raise clover. In fact, for half a dozen years back, I have not had a really good crop of clover on the farm, and if it had not been for corn-fodder, I should not have been able to carry the desired amount of stock.

I raised corn-fodder because I could get the necessary food in no other way. Corn-fodder is a sure crop, and while by no means equal to clover hay, it is a good deal better than nothing. In fact, the longer I raise it, the better I like the crop.

I have raised it, not for soiling, but for fodder in winter. For this purpose, it is certainly a most desirable crop on my farm.

I have thought it might be better to plant a larger area of corn, using the grain for the pigs, and the stalks for cattle and sheep. But the corn-crop, in this section, requires too much work during the short and busy days of autumn to admit of a greatly extended area. But this objection does not hold in regard to corn grown exclusively for fodder. There is no husking. All we have to do is to cut the crop with a reaping machine, and bind it into bundles, and put it in large stooks for the winter. As soon as we get a good reaper and binder that will cut and bind the corn into sheaves, it is clear to my mind that there is no crop that we can grow in this climate, with the same amount of expense, that will afford so much food per acre.

"That may be all so," said the Doctor, "but the trouble is that the corn-fodder is not rich enough. There is more food per acre, it may be, than in any other of our commonly cultivated crops, but this actual food is mixed with too great a quantity of indigestible woody-fibre. If we could get rid of 500 lbs. of woody-fibre out of every ton of dry corn-fodder, the 1,500 lbs. that would be left would be worth far more, in my judgment, than the ton. If I had two acres of good rich land nicely prepared for drilling in corn-fodder, and was offered two varieties of corn, one of which was warranted to produce 6 tons per acre, and another 4 tons per acre, I would take the variety that would produce the smallest crop, in the hope that the 4 tons would contain as much, or nearly as much, actual food as the 6 tons, and if so, it would not only cost less to harvest it, but it would be far more profitable as a milk or flesh producing food than the six tons. "I do not say," continued the Doctor, "that we have varieties of corn that will afford a small yield of unusually rich fodder. But if we have, those are the varieties that we ought to grow. And our Experiment Station might do a worse thing than to investigate this subject."

"Prof. S. W. Johnson," said I, "has made some careful analyses of corn-fodder that are of unusual interest, and his remarks on the subject, like everything from his pen, are of great value."

"Very true," said the Doctor, "but they do not touch the real point. We are told how much corn-fodder was raised per acre, and how much nutriment the crop contained. But that is all. There is nothing to compare it with. It is good as far as it goes, but it does not go far enough."

After the Doctor had gone, the Deacon remarked: "Some people are hard to please. I do not know when I have read anything that pleased me so much as this same paper on corn-fodder."

"It is indeed a remarkable paper," said I. "Just such a paper as one would expect from the author of 'How Crops Grow,' and 'How Crops Feed,' the two best books on scientific agriculture that have appeared during the last thirty years."

The fodder-corn, analyzed by Prof. Johnson, was grown by Mr. J. J. Webb, near New Haven, Conn. The variety sown was the Southern or Norfolk White. Three bushels of seed were drilled in per acre in rows two feet apart. Two crops were raised, one sown from 10 to 15 days later than the other.

The crop was cut September 1st. The yield of the early sown field was as follows:

When cut, September 1.....25½ tons per acre.
Cured in field, November 11..... 5⅕ " "
In barn, February 8..... 8½ " "

The yield of the late sown crop was as follows:

When cut, September 1..... ..27 tons per acre.
Cured in field, November 11..... 4⅘ " "
In barn, February 8..... 7½ " "

It is a curious fact, that 5½ tons of corn-fodder put in the barn, in November, should weigh 8¼ tons in February. Prof. Johnson attributes it to the fact that the weather was very dry and fine in the fall, and the corn-fodder was exceptionally well cured in the field. But the winter was very rainy and damp, "and the loosely packed corn-fodder gained moisture."

"I have always known," said the Deacon, "that corn-fodder would get limp and soft in dark weather, but did not suppose that it would attract so much moisture."

"Cattle," said Mr. Strong, who has had considerable experience in feeding corn-fodder, "will always eat corn-fodder better if it is flung out on the barn floor in damp weather, or out of doors where the dew will moisten it. It will gather moisture like a sponge."

The following table shows the average composition of the two crops of corn-fodder at the time it was cut, Sept. 1, and also when well cured in the field, Nov. 11, and again after it had been loosely stored away in the barn until February 10. The composition of the fodder, when entirely free from water, is given in the last column.

TABLE SHOWING THE COMPOSITION OF CORN-FODDER.

	Fresh Cut, Sept. 1.	*Field Cured, Nov. 11.*	*In Barn, Feb. 10.*	*In the Dry Fodder entirely free from Water.*
Water	86.11	27.25	54.35	
Ash	0.79	4.19	2.64	5.76
Albuminoids	0.83	4.38	2.76	6.03
Fat, etc.	0.25	1.31	.82	1.80
Cellulose	0.77	24.97	15.66	34.32
Carbo-hydrates (starch, sugar, gum, etc.)	7.25	37.89	23.75	52.09

Good clover hay contains about 16 per cent of water. The corn-fodder contains, when fed out in February, 54 per cent—nearly 3½ times as much.

Good clover, when cut just as it is coming into blossom in June, contains 75 per cent of water, but we often let clover grow, until I question whether it contains 50 per cent of water. In other words, it is not as succulent as corn-fodder in our damp seashore climate in winter. The relish with which cattle and sheep will eat corn-fodder, after they have been fed for some time on dry hay, is doubtless due to the greater succulence of the corn-fodder. It is not because it is richer. In fact, the corn-fodder grown by Mr. Webb was not nearly so nutritious as good Timothy or clover hay.

Prof. Johnson gives the following table, showing the average composition of German hay and German corn-fodder, as compared with the American corn-fodder. The figures represent the amount of ingredients in 100 parts of the dry hay and fodder.

	German.		Mr. Webb's.	
	Meadow Hay.	*Red Clover.*	*Maize Fodder.*	*Maize Fodder.*
Ash	7.7	7.4	6.7	5.8
Albuminoids—so-called flesh-formers	11.8	16.6	12.4	6.0
Fat	2.7	2.7	3.7	1.8
Cellulose—woody-fibre	29.9	30.1	29.3	34.3
Carbo-hydrates, (starch, gum, sugar, etc.)	47.9	43.2	47.9	52.1

The German corn-fodder is quite as nutritious as good hay, but the American corn-fodder is decidedly inferior. This is doubtless due to the fact that a large growing variety of corn was sown by Mr. Webb. Some of the stalks were 14 feet high. It produced too much woody-fibre. For corn-fodder, we want a small variety and rich land. A lover of celery prefers to grow the "Incomparable Dwarf" rather than the "Immeasurable Mammoth."

In the condition in which the corn-fodder was fed out in the winter, the average yield per acre was 8 tons of corn-fodder, containing an amount of absolute nutriment fully equally to 4 tons of good hay. So far as the yield per acre is concerned, therefore, corn-fodder is decidedly a profitable crop. The objection to the crop is, that it is too bulky—too innutritious. Such a crop as that grown by Mr. Webb could be used to advantage by a farmer who takes horses to board for the winter at so much per head per week. It will keep them alive and healthy. But for cows giving milk, or for young stock, or for fattening cattle, it is not rich enough. We want such animals to eat all the food they can digest, and such corn-fodder as that under consideration is too bulky. The stomachs of the animals will not hold all that could be digested. And in feeding such corn-fodder we must give the animals more or less grain or oil cake. It will pay well to do so, but it would pay still better to grow a richer and less bulky crop.

"It is easy enough," said the Deacon, "to grow a less bulky crop."

"True," said I; "but possibly not so easy to grow a crop rich in nutriment. This is the point that farmers and scientific men should investigate. If I was going to raise peas to cut green for hay, I would not select 'Champion of England.' The 'Little Gem,' or some other dwarf kind, would give a less bulky, but far more nutritious crop of hay; and it can not be doubted that the skill and intelligence which produced the dwarf pea, can produce a dwarf and highly nutritious variety of corn to be grown for fodder. These skillful plant-breeders will give us just what variety we ask for, and we should be careful to ask for that which is really good, and not for that which is merely 'big.' Then, when we have a fine, small-growing variety, we should sow early, on dry land, well and properly manured, either directly or indirectly. We should have a crop, say 6 feet high, and yielding 3 tons of the richest, and choicest, and most easily-digested 'maize hay' that could be cut and bound into sheaves by a reaper, at a cost not to exceed the cost of cutting and curing hay."

"There is one thing," said the Deacon, "in favor of sowing a small variety of corn for fodder. It will cure much more rapidly than the large varieties that have thick, long stalks. The larger the proportion of leaf to stalk, the quicker it will cure."

"That is very true," said I, "and I doubt not that we could cure the corn-fodder, or 'maize hay,' during our hot August or September weather, so that it could be put at once into the barn or stack, just as we do other hay. Such corn-fodder as I raised this year from a small early variety of our common corn, I think might have been stacked with perfect safety, especially if a layer of dry straw had been placed between each layer of stalks. I have tried stacking corn-fodder with greater or less success. I can see now where I have erred. We have postponed the operation too long. When the corn-fodder is well cured, the sooner it is in the stack or barn, the better. It will evidently attract a larger amount of moisture when exposed to a damp atmosphere; and it must be remembered that this external moisture is far more likely to cause the fodder to mold than the moisture or sap which is in the plants. The crop is rich enough in gum, starch, and sugar, to keep it from fermenting; or, if it is not, it ought to be, and would be, if we raised a small rich variety.

PRESENT VALUE OF COWS.—Public sales are a very certain index of values. The following prices realized for cows at recent sales in Eastern Pennsylvania, where there is not only good stock, but an active demand for animals at all times, will tend to show what ordinary farm cows are now worth. A sale of 20 averaged $42.86 per head; 25 others brought an average of $53.05 each, and another sale of 55 ordinary good animals made an average of $52.

A Steam Pump for Irrigation or Domestic Use.

We have been using a steam pump during the past summer, by way of experiment, for irrigation and for pumping water for domestic use. The value of a practicable and cheap method of irrigation for market and fruit gardens, or for private gardens and lawns, and of a certain supply of water for domestic purposes is evident, and it is only necessary to be assured that the method is practicable and cheap, for a large number of persons to avail themselves of it. The pump we have been using is operated by an "Economizer" steam boiler of 2½ horse power, both of which are made by Porter Manufacturing Company, Limited, for Whitman & Burrell, of Little Falls, N. Y. The pump is operated directly by steam from the boiler, without any engine, and so far has worked in a very satisfactory manner. The pump is arranged either separately upon a frame not directly connected with the boiler, as shown at figures 1 and 2, or affixed to the boiler as at figure 3. In the first instance the pump is set upon a frame beneath a tank, which holds a supply of water for the boiler. This is fed directly and automatically by a simple provision of pipes; the water flows from the tank into the boiler as soon as the water-level in the latter falls below a certain point; therefore, so long as there is water in the tank, that in the boiler can never fall below a proper level. All that is necessary to ensure absolute safety in this respect, is to see that the tank is always supplied with water; the tank is provided with a water-gauge that this may be done without difficulty. In figure 1 is shown the front view of the boiler, tank, and pump, with the connections for carrying steam from the boiler to the pump and for the water supply. The rear view is shown at figure 2. We have had these engravings very carefully made, showing these connections accurately, so that any person may readily put them together. The boiler (*A*) and tank frame rest upon cross timbers, 4 x 8, to which they are bolted, the near foot of the tank frame being exactly 11 inches from the near edge of the supporting timber to which the foot of the boiler is bolted. The front of the boiler at the lower part, is exactly 7 inches in advance of the front of the tank frame. When thus placed, all the pipe connections furnished with the boiler, etc., fit accurately. The tank, *B*, is placed on the frame above the steam cylinder, *C*, and pump *D*, as shown in figures 1 and 2. The following references apply to figures 1 and 2 and partly to figure 3:—*a*, the safety valve; *b*, the steam-gauge; *d*, the steam pipe to the tank; when the water in the boiler falls below the mouth of this pipe, steam enters, raising the pressure in the tank as high as in the boiler, and forces water from the tank through the water pipe *e* into the boiler; at *f* is the blow-off pipe by which the boiler is emptied; at *g* the exhaust pipe from the cylinder, which discharges into the smoke-stack; at *h*, *h*, is the steam pipe from the boiler to the steam cylinder, with valve; at *i* is the feed pipe to the tank connected with the discharge pipe from the pump, and shut off or opened by the cock shown in the engraving; at *j* is the discharge pipe from the pump; this is made either to connect with a rubber hose or with iron pipes, which convey the water to its destination; at *k* is the balance-wheel, provided with a handle by which the pump may be worked by hand to fill the boiler or tank before firing up; at *l* is the water-gauge, showing the hight of the water in the tank; at *m* is the supply pipe to the pump; in figures 1 and 2 this is connected with a well near by; in figure 3 it is carried to a river, from which the supply is drawn. This pipe is 1¼ inch in diameter up to the connection with the pump, the discharge being a one-inch pipe. At *n* is the waste steam pipe from the boiler. At figure 3 is shown the arrangement of the pump when affixed to the boiler. This is found to work very satisfactorily in drawing water from a river and forcing it through 1,200 feet of iron pipe to a series of hydrants, from which it is used in the irrigation of a large garden, the supply of several greenhouses, and other uses. Some persons will prefer this arrangement, which is economical of space, while others will choose that shown at figures 1 and 2, in which safety is made so absolute that the boiler may be securely left in charge of an inexperienced man for several hours, if the tank is left full of water. The pump arranged, as shown in these engravings, has been used for the watering of a garden and lawn of 3 acres through 250 feet of rubber hose, and for the supply of a tank in the dwelling house, the hose being connected with the tap (shown in figure 4) upon the supply-pipe to the tank in the attic. The lower tap closes the connection with a hand force pump, (Blunt's Universal Pump), kept for use in case of accident. With a pressure of 20 pounds of steam, the water is forced through the hose and a ½-inch nozzle, and thrown 50 feet from the nozzle. After some months use of the pump, which is shown without any connections at figure 5, we find it to work very well, and to cost so little, that, to say nothing of its other valuable uses, it is more economical than the employment of a man once a week to fill a tank holding 1,000 gallons of water, by hand. The boiler is heated very rapidly, a little waste wood being sufficient to get up steam and run the pump for an hour or two. In a dry season, or even in the few dry weeks of spring, when garden crops are in a critical condition, the whole cost of the boiler and pump might be saved in the rescue of young plants from drouth, or in the rapid forwarding of their growth, in preserving the fresh verdure of a lawn, or in furnishing a supply of water to a stable or barn yard.

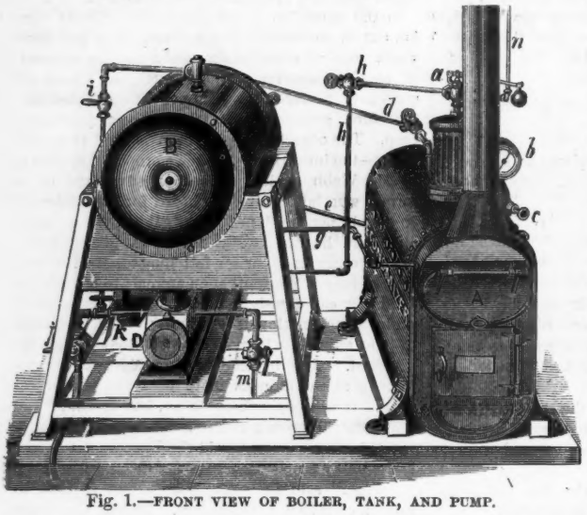


Fig. 1.—FRONT VIEW OF BOILER, TANK, AND PUMP.

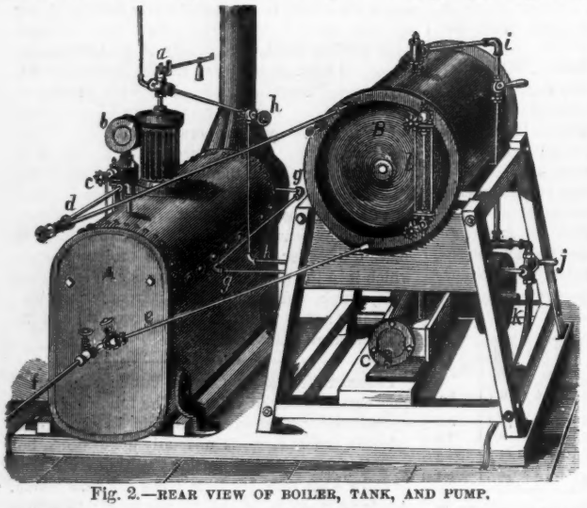


Fig. 2.—REAR VIEW OF BOILER, TANK, AND PUMP.

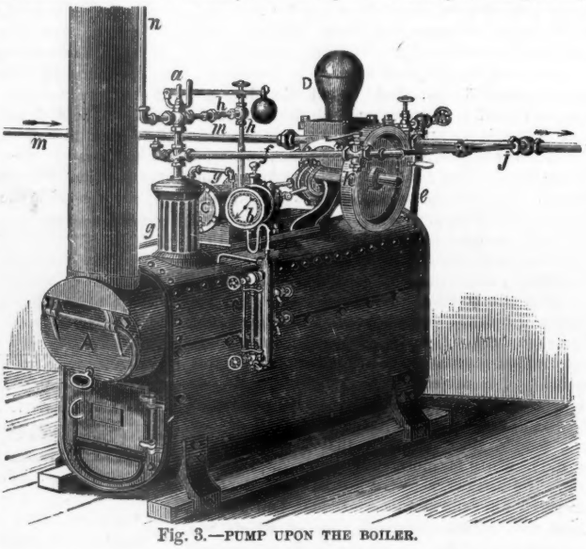


Fig. 3.—PUMP UPON THE BOILER.

Fig. 4.
CONNECTION.

CANNING RABBITS IN AUSTRALIA.—An instance of the profitable use of what has been, and yet is, a most destructive pest in Australia, is given in the new business of putting up the flesh of rabbits in cans for exportation to Europe. Formerly these rabbits existed in such numbers, that not only were the farm crops completely destroyed in some districts, but the grass was devoured, and the sheep pastures rendered useless. Many devices for their destruction were tried without success, until the idea of turning them to account was put into practice. A company was formed which steadily employed a number of hunters to trap the rabbits, for the purpose of dressing their flesh for canning. About 200 tons of the meat have so far been put up, and 5,000 rabbits per day are now canned. The heads are boiled down to glue, and the skins are

Fig. 5.—PUMP.

preserved for sale to hatters, who use the fur. The farmers are still troubled with the pests, but such wholesale destruction must in time have the effect of reducing their ravages. In parts of Oregon, rabbits have caused very extensive destruction of crops, and a hint may be gathered from the Australian plan, which may lead to measures of relief and turn the pests to profit.

Some Useful Corn Mills.

Corn is so cheap that many do not take the trouble to be saving with it, and no grain is so wastefully

Fig. 1.—"BIG GIANT" CORN MILL.

used. Economy is too rarely considered on American farms. "Lightly come; lightly go," seems to be the principle on which we all are too ready to act, and we throw out our whole grain with a liberality that is both wasteful and costly. Now it is certain, that grain when crushed or ground is worth more for feeding than when whole. It is eaten with less muscular effort, which is in reality no inconsiderable gain, as for every movement of one single muscle there is an expenditure of vital force which requires the consumption of some food to replace it. Ground corn is also more easily digested, and there is less loss of undigested grains, which are carried off with the excrement—a loss which is in some cases equal to a quarter or a half of the quantity fed. To get our grain ground costs 11 per cent of it. For every 10 bushels taken to the mill, we get 9 returned, a cost of one-ninth. For every $9 worth of corn fed, we pay the miller one dollar. In feeding $500 worth of grain, then, the loss is equal to $55. Many farmers pay this amount every year, and besides lose many days time in going to and returning from the mill. Now it is very plain that if a farmer, who has been in the habit of feeding this quantity of grain every year, could procure a mill for the same amount that he pays yearly for his grinding, the mill would be paid for in one year, and ever afterwards the grinding would cost nothing, because it would take no longer to grind at home than to go to the mill. Many farmers, if such a mill be pointed out to them, will avail themselves of its advantages at once. A mill

Fig. 2.—OUTSIDE SHELL OF "BIG GIANT."

that will grind 20 bushels of corn-ears, or 15 bushels of shelled-corn, into meal in an hour, with two horses attached to the sweep, is shown at figure 1. It is the "Big Giant" corn mill, made by Jas. A. Field, Son & Co., of St. Louis, Mo. The engraving shows the mill set in its frame, ready to be staked to the ground, or to be bolted to a barn floor. It is operated by a sweep, to which the horses are attached, and which embraces the outside shell of the mill, which is shown at figure 2. The inside cone is shown at figure 3. The cutters are arranged upon the upper part of the cone, and the grinding parts at the lower portion. The outside shell is similarly arranged, and by elevating or depressing the latter, by means of set screws, the meal is made coarser or finer. Corn in the ear, or ears with the husk, as stripped from the stalk, may be ground in this mill as easily as shelled corn, the cob being reduced to meal with the corn. The advantage of this to large hog, cattle, or sheep-feeders, is apparent at once. In grinding corn in the shuck, a little extra care in feeding the mill will be necessary. Having seen this mill at work, grinding both shelled corn, and ears yet green from the field, into meal, we can say from personal inspection that it does its work easily and excellently, and is a valuable and effective machine. This mill is also made with gearing, to be operated by water or steam power.

At figure 4 is shown a combined corn-sheller and mill, known as the "Mishawaka Feed Mill," made by the St. Joseph Manufacturing Co., of Mishawaka, Indiana. It shells and grinds at the same time, or does either separately. It can be operated by hand or by power; with power it grinds 15 bushels an hour. The grinding plates are made of hard iron, and are expected to grind 1,000 bushels without being renewed. When worn, they are replaced with little cost and great ease. The mill is simple, durable, and works with light power. It grinds fine enough for feed only. Another useful feed mill is the "IXL" Mill (fig. 5), of the U. S. Wind Engine and Pump Co., of Batavia, Ill. This is

Fig. 3.—INSIDE CONE OF "BIG GIANT."

wholly of iron, and is run by power. The chilled iron grinding plates have grinding surfaces on both sides, and can be reversed. One set is expected to grind 4,000 bushels before they are completely worn out, when they can be replaced. To own one of these serviceable mills, could not fail to be profitable where a large quantity of grain is fed; and where but little is used the convenience of having one's own mill may still be enjoyed if a few neighbors could join in purchasing one. That would save many a tiresome journey to and from a grist mill in disagreeable weather, and over bad roads.

Why We Should Grow Wool and Mutton.

The consumption of wool in the United States is far ahead of its production; a certain market is therefore offered for all we can produce. For several years past, the operation of a tariff has rendered the market for our wool steady and profitable to the growers; and which has helped, if it has not induced, an extension of sheep culture beyond any precedent, and at the same time greatly encouraged the woolen manufacture. The growth of wool and its manufacture into various fabrics, are necessarily closely related industries, and one flourishes or suffers with the other. At the present time, our woolen manufactures surpass in excellence those of any other country. The Centennial Exhibition proved this. The finest broadcloth there, was made in the State of Maine, but it is mortifying to us to have to confess that the wool was brought from Silesia, while we are as well able to grow it as are the German farmers. The American

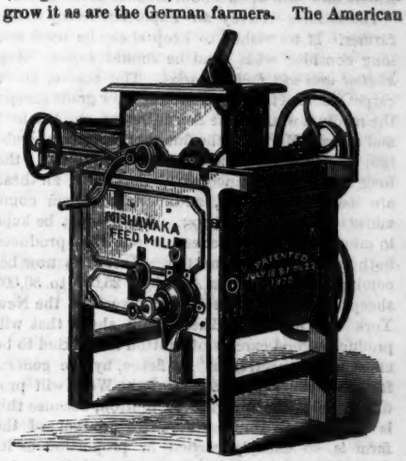


Fig. 4.—THE MISHAWAKA FEED MILL.

cassimeres were not excelled by any from foreign countries; these are made from American fine to medium or merino wool. American flannels are better than similar European fabrics, because they are made from American wool, which is better than any we could import for this purpose. Our blankets are superior to any foreign ones; those made in California and Minnesota surpassed any others that were shown at the Centennial, and the Minnesota blankets are actually exported to Europe for use in railroad sleeping cars. American knit goods of the very best quality are made from our combing wools. A most beautiful fabric, the America "India" shawl, is made from our finest long wool. Our worsted fabrics, delaines, and cashmeres, are made from our home-grown wools; but our alpacas are made from English combing wool. These last mentioned goods are so excellently made that they are excluding foreign fabrics, and are helping to turn the balance of the foreign trade greatly in our favor. One mill used for these goods 10,000 fleeces weekly. For the first time in our history, our national flag is made of American grown Cotswold wool, as are also the present fashionable bunting goods for ladies dresses. In carpets we excel the long-famed English manufactures. Over 100 factories in Philadelphia, alone, are making carpets, and others are at work in scores of villages and towns. "Ingrain," which has two colors in a line; "three-ply," which has three; "tapestry," which is printed; "Brussels," which is dyed in the yarn; "Wilton," "tapestry-velvet," and "Axminster," which are all velvet; all these are now made in this

Fig. 5.—THE IXL FEED MILL.

country and sold so cheaply that almost every house in the whole land has carpets upon its floors. Lastly, the worsted coatings, with which our men of all degrees and professions are clothed, are

chiefly made from our home-grown medium wools, and were it not for the foolish fashion, which induces many persons to choose cloths of professedly foreign make—but for the most part really home made—we should rarely see any but an American brand upon all our woolen piece goods.

These facts convey an important lesson to the farmer. If he wishes to keep sheep he need not long consider what kind he should select. *Any kind of wool will find a market.* The coarse, short carpet wools of the poor Texan and low grade sheep; the medium wool of the South-Downs, and the half and quarter Merinos; the fine short and long combign, merino wools; the very fine Silesia wools; the long wools of the Lincoln and Cotswold; all these are used and wanted, and none of them come amiss to the manufacturer. But it must be kept in mind that the best sheep is one that produces both wool and good mutton. Mutton is now becoming a staple food in America; 25,000 to 30,000 sheep and lambs are sold every week in the New York city markets. Therefore a sheep that will produce a good carcass of mutton is the kind to be chosen, irrespective of its fleece, by the general farmer. The sheep ranges of the West will produce wool without regard to mutton, because this is most easily transported. No product of the farm is so cheaply carried in proportion to its value, as wool. $100 worth of wool is carried from Chicago or St. Louis to New York for $4; while to transport the same value of beef the same distance costs $20; of pork, $30, and of corn, $50.

These figures will help to give one an adequate idea of the staple and permanent character of the wool growing industry, and of its certain profitableness. We might strengthen the force of these by a reference to the advantages gained by farmers in the way of improved cultivation, and the increasing fertility of the farm through sheep culture. Of these we cannot now speak, but they are by no means unworthy of regard, nor do they admit of any question as to their certain effectiveness. It is enough now to show that the farmer has a certain market for whatever kind of wool he may grow, if it is good of its kind, and that the mutton is as readily salable as the wool.

Hints and Helps for Farmers.

A "CRAB" FOR SHOCKING CORN.—"H. S. S.," Riverside, Iowa, sends a sketch of a "crab" for supporting corn until the shocks are set up and tied. It is made of a block of wood, 8 inches long, and 2 inches thick, into which one of the legs, four feet long, and an inch and a half thick, shown at figure 1, is fastened securely. The other two legs are loosely inserted, so that when the shock is completed they may be pulled out; when the head of the "crab," with the remaining leg is removed, and the contrivance again set up for another shock. This is found very useful when corn is shocked in wide rows for plowing for wheat. The plan followed is to cut 6 rows, throwing three rows on each side, and then plow that strip and set up the

Fig. 1.—CRAB FOR SHOCKING CORN.

crab for shocking on the plowed ground, then cut 6 more rows on each side, making 18 rows in all, finish the shocks and go on with the plowing. Then repeat the process.

A NEW BUTTER WORKER.—To work butter with the hands destroys the texture and quality, and to use the common butter ladle is hard work for the hands and arms. A machine that will effectively do this work will be found a great help and convenience in the dairy. We recently procured a butter worker, which is shown at figure 2, made by Henderson & Co., 316 Race Street, Philadelphia, which performs very satisfactorily. It is easy to work, and a child can operate it. The table or tray is hollow, so that the butter-milk runs to the center and there escapes through the perforated spindle into a pail beneath. The ladle rotates, and its action is that of the common hand-ladle in working the butter and freeing it from butter-milk. The gearing is covered, so that no butter can work into it. The whole can be taken apart in an instant and cleaned. From 25 to 100 pounds of butter can be worked at one time with the different sizes; the largest size being well adapted for use in country stores where butter, of different qualities and colors, has to be mixed and w rked together.

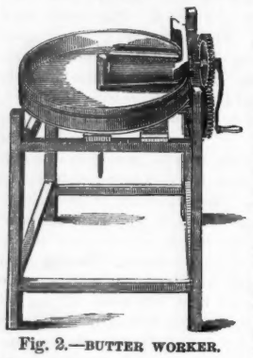


Fig. 2.—BUTTER WORKER.

Fig. 3.—HEDGE GUARD.

TO PREVENT COWS GOING THROUGH HEDGES.—"H. S. S." fastens a pole 4 feet long to the horns by a strap, as shown at figure 3; to prevent them from pushing down fences, he fastens the T shaped board (figure 4) on to the horns by the holes seen in the engraving, at the lower end there are a few sharp-pointed nails, which will not prick the nose unless the cow attempts to push against the fence; when the nails give her a sharp reminder that she is trespassing.

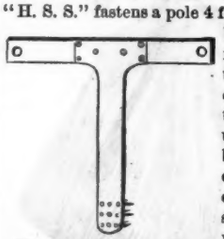


Fig. 4.—FENCE GUARD.

A FEED-BOX FOR SHEEP.—"J. H. S.," Logan, Ind., sends a description of a feed-box to accommodate 25 to 35 sheep, an engraving of which is shown at figure 5. The box is made as follows:—The posts, six in number, are 28 inches long, and 2 x 2½ thick. The boards for the bottom and sides are 16 feet long, the former is 14 inches wide, the lower side boards are 10 inches wide, and the upper ones 6 inches; this leaves an open space of 10 inches for the heads of the sheep, which is ample. This sort of box answers well for feeding cut clover, hay, or chopped roots, and prevents the sheep from standing upon and fouling their feed, or getting litter into their wool.

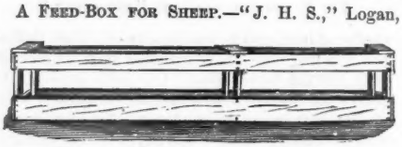


Fig. 5.—BOX FOR FEEDING SHEEP.

HOW TO USE A GATE FOR SEPARATING STOCK.—When the gates, *A* and *B*, are arranged as in figure 6, and both opened together, they will meet at *D*. If they are then hooked together, small stock only can pass through, as the space is but 18 inches. To move large stock from lot No. 1 to No. 2, the gates are both opened to *C*, and latched to the post there. This opens lots 1 and 2, but keeps No. 3 closed. To throw all open at once, the gates are swung back to *E* and *F*, and latched on to the posts; the tops of the posts being cut for this purpose, as shown at figure 7.

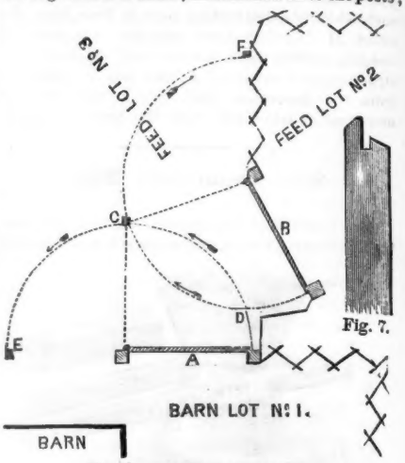


Fig. 6.—DIAGRAM OF GATES.

Fig. 7.

A BULL RINGER.—A subscriber sends us a small piece of wood, cut and smoothed to the shape shown at figure 8. This is made to fit the thin part of the ring, tightly, so as to hold its place. The end of the ring, protected by this piece of smooth wood, is passed through the hole made in the bull's nose, much more easily and less painfully than the sharp-edged portion of the ring. When the ring has been inserted, the piece of wood is removed, and the ring fastened in the usual manner.

Fig. 8.

Sloping-Toothed Harrows for Cultivating Growing Crops.

For some years past it has been the practice of many of the better class of farmers to harrow their young wheat, oats, corn, and potatoes, to destroy newly-sprouted weeds, and to loosen the soil. Fall wheat has been harrowed, soon after it had taken a secure hold on the soil, before the winter had set in, and in the spring as soon as the soil had become firm and dry. This has proved to be greatly beneficial to the crops. Young corn, also, has been worked with the harrow until it was a foot high, and with benefit. Still the excellent practice of harrowing young crops is not nearly so general as it should be, and in order that our readers may become better acquainted with it, and the kinds of harrows used for the purpose, we give the accompanying illustrations of two implements designed for this use. These harrows should have, then, teeth slope backwards, at an angle of about 45 degrees; should be light, and their teeth should be fine and sharp. A harrow of this kind is hardly suitable for other uses, and few farmers can afford

Fig. 1.—SLOPING-TOOTHED HARROW.

to have a different harrow for every different work. The implements we here describe are made to meet

the needs of farmers for all kinds of work; for smoothing the ground after plowing, for covering seeds, for gathering weeds and roots from the soil, for stirring summer or fall fallows, and for cultivating growing crops in the manner above mentioned. To meet all these needs, the device of movable teeth has been adopted. When these harrows are drawn one direction, the teeth slope, and they can then be used as cultivators, for covering seed, or harrowing lightly-turned sod without disturbing it. When they are reversed, the teeth are upright, and perform the ordinary work of the common harrow. In principle, both these harrows are similar, but in construction they differ. That

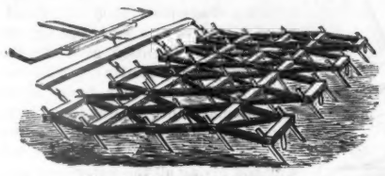


Fig. 2.—BRADLEY HARROW.

of which one-half is shown at figure 1, which is made by the New York Plow Co., of New York, has a wooden frame, and the teeth, of elastic steel, are loosely hung or attached. This device gives the harrow a peculiarly easy motion over growing crops, so that no injury is done to the plants, and the teeth, in passing over the slight depressions in all plowed soil drop down and do their work in those low spots, that would otherwise be passed over without being touched, unless the harrow should run so deeply as to injure the young plants. The illustration shows only one-half the harrow, which is very broad, covering 10 feet in width. A separate tooth is shown, which illustrates its peculiar structure. When the harrow is reversed the teeth are straight and rigid. At figures 2 and 3 are shown the "Bradley Harrow." This is also reversible, and acts in each of the methods we have described, as

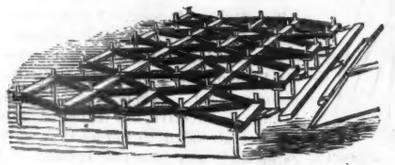


Fig. 3.—BRADLEY HARROW REVERSED.

it is drawn in one direction or the other. This has an iron frame, and is so hinged that it bends and conforms to the surface of uneven ground. It is made by the Bradley Manufacturing Company, of Syracuse, N. Y., for whom Messrs. R. H. Allen & Co., of New York, are the sole agents.

The use of these harrows is one of the modern improvements in agriculture. Good farmers estimate the increased yield of grain from harrowing at 5 bushels per acre, and upwards. This is a moderate estimate, but it does not include all the advantages gained. Perhaps the destruction of weeds, which is not only a present benefit, but a permanent improvement to the soil, is of greater value than the increase of crop. A clean field is not only a pleasant thing to see, but the absence of weeds brings money to the pocket in enlarging our crops and in saving labor. A weed killed is so much gained, with the addition that an immense progeny is prevented from following it. Those who have harrowed their grain crops will always continue the practice; those who have never done it, should by all means make the experiment the coming season.

The Trial of Farm Steam Engines at Syracuse, N. Y.

The New York State Agricultural Society, with commendable enterprise, held a competitive trial of portable farm Steam Engines, at Syracuse, N. Y., on the 12th of November last. The rapidly extending use of steam engines on the farm makes it very desirable that the peculiar merits of the many good engines now in the market should become widely known, and a public trial is an excellent means to this end. The trial took place at the large foundry room of the Bradley Manufacturing Company. The trial was under the superintendence of a Committee composed of James Geddes, Esq., Vice President of the Society; Prof. Green, of Troy, N. Y., and Henry Waterman, of Hudson, N. Y. The engines subjected to trial were the "Economizer," 10-horse power, made by the Porter Manufacturing Co.; the "Mills," 10-horse power, by the Fishkill Landing Machine Co.; the "Westinghouse," "Birdsall," "Eclipse," "Mansfield," "Oneida," "Watertown," "Payne & Son's," and a 6-horse power "Economizer," engines. The test applied was the driving of a double-acting pump. Records were made every 15 minutes of the velocity of the engines, the revolutions of the pump pulley, the pressure on the pump, and temperature of the feed water. The water and coal used were accurately weighed. Each test occupied 4 hours. Each of the engines seemed to work well, but the actual result cannot be ascertained with exactness until all the recorded data are figured out and compared. This will require some time, and the report cannot be had until the Committee have concluded their labors. A number of farmers and thrashers were in attendance, and closely watched the proceedings.

Poultry-Keeping—How to Begin.

There is a very general desire to engage in keeping poultry. The business does not require hard work; and is attractive and agreeable. It also promises to be profitable, and profit is the chief inducement to the majority of the novices who desire to attempt it. A few general cautions are needed by those who would undertake this business.

A novice can not, by the mere use of money, take up poultry-keeping and make a success. On the contrary, he will be more than likely to lose all the money he invests, if he supposes that the business consists only in buying some fowls and feed, and in selling eggs and chickens, by simply permitting the hens to produce eggs while he gathers them. Success only comes to the long-experienced poultry man who knows precisely what is to be done to secure this result. It is best to begin with a few fowls, making their keeping a secondary business, until these can be managed with success and profit. Then the number may be increased, and when the business pays sufficiently, then sole attention may be given to it. It is more profitable to purchase fowls than eggs. This is a simple matter of figuring. If a dozen of eggs of choice fowls are procured at a cost of say $5, a year will elapse before any profit can be gained from the three or four pullets that may probably be hatched from them. If a trio of birds are purchased at a cost of say $20 now, a number of eggs will be procured before setting time arrives, and then each hen may bring out a brood of eight or ten chicks. After these are raised, more eggs will be laid, and if good care is given, there may be on the whole 20 dozen of eggs, ten pullets and ten cockerels, as the produce of this trio within the same time that it would have taken, from the dozen of eggs first mentioned, to produce three or four pullets. There is an obvious difference in favor of beginning with birds, both as to profit and time.

CHEAPNESS OF PRODUCTION.—In every department of industry the tendency is, to reduce the cost of production, by means of more effective methods and more skillful work. We are even now securing many foreign markets for produce, and for manufactured articles of many kinds, merely because we can produce them cheaply. We are exporting iron, steel, and tools of various kinds, as well as machinery, from locomotives and other heavy engines, to plows and apple-parers. We are sending off cutlery, cotton goods, leather, boots and shoes, clothing, as well as a vast amount of small articles of hardware, "notions," and rubber goods, with agricultural and other raw produce. Generally, agriculture is beaten in the competition for cheapness of production, and the export trade does not satisfy farmers as to the prices realized. We shall soon mend this in other produce, as we have already done as regards the production of beef, which is exported at a satisfactory profit to the stock men. They have cheapened their product by the use of improved stock, and a similar course of improvement must be pursued in all departments of agriculture, by the use of the best methods and the best stock, seeds, machines, and implements. If by the use of these we lessen the cost of our products, we add to our profits to the same extent; and if we increase the amount of our products at the same time, we can afford to sell cheaper, and yet make more profit than we now do.

A Promising Forage Plant—"Egyptian" or "Pearl" Millet. (*Penicillaria spicata.*)

One's knowledge of a plant sometimes comes in a very roundabout way. Several years ago, at one of the meetings of the American Pomological Society, we found that one of the members from Tennessee, in anticipation of meeting us, had brought a bundle of grasses to be named, among them was one, which, under the not very elegant name of "Horse Millet," was highly esteemed in his neighborhood, but of which he could give us no history. Taking the specimen home, we, upon exmination, determined it to be *Penicillaria spicata*. Some botanists do not consider the genus *Penicillaria* as sufficiently distinct from *Pennisetum* but this is not the proper place to discuss this point, and the name *Penicillaria* will answer well enough at present for the grass. Sometime last winter, Mr. A. S. Fuller, the accomplished agricultural editor of the "N. Y. Weekly Sun," received a specimen of the same grass from one of his Southern correspondents, of which he kindly gave us a share, and we intended to cultivate the plants and thus get specimens for an illustration and materials for an article, on what we supposed was an entire novelty. Illness at just the time when spring operations begun upset this and other experimental planting, and though we failed to sow the seeds, our friend Fuller did sow them, and obtained a crop of the Millet, concering which he gave a full account in his department of the "Weekly Sun." But the strangest thing of all is, that the plant is comparatively an old one, and was tested long ago in Connecticut. The knowledge that we were seeking concerning it had already been acquired, and in good part recorded by our former associate, Col. M. C. Weld, who, before he was connected with the *American Agriculturist*, edited that excellent paper, "The Homestead," at Hartford, Conn. Col. W., without knowing that the plant had been under investigation by us, sent an article giving his experience with *Penicillaria*, which he had tested some twenty years ago, and which he had at that time given some account of in "The Homstead." Col. Weld's article was written last spring, but we did not publish it then, as we wished to accompany it with an engraving. This we are now enabled to do through the courtesy of Mr. W.H. Carson, seedsman, No. 125 Chamber St., N. Y., who has secured a limited stock of the seeds. We saw Mr. Fuller's plants, and think that, on account of its short joints, the amount of foliage is greater than that of any forage plant we have seen, not excepting Indian corn. Col. Weld's account closely agrees with that given by Mr. Fuller. Col. W. says:

"I had sent to me the seed of a tall, leafy, luxuriant, rapid-growing grass, that was highly valued in Florida, under the name of "Egyptian Millet." We distributed a good deal of seed from our office, and the following results were very uniformly obtained: (I have refreshed my memory from files of "The Homestead," especially from the volume for 1857-8.) It would not mature in Connecticut, hence we obtained our seed from the South. It often attained the hight of six to eight feet before showing a head. It was very small and unpromising at first, but finally "tillered" enormously, producing a great many suckers, or rather

stems from one seed. Plants were not uncommon, exhibiting fifteen or twenty stalks, and sometimes as many as twenty-four were thrown up. If cut when three or four feet high, for feeding green, it might be cut several times in one season. The stalks were not large when standing rather thickly, but quite tender and sweet, even when dry. It was exceedingly leafy and succulent when green, and was greedily devoured by cattle. Cut when the heads appeared, and dried as hay, or corn, it made sweet palatable hay, and was much more easily cured than corn-fodder. The largest actual yield reported was over nine and a half tons of dry fodder, per acre. This crop was left until after severe frost, in the vain hope of securing ripened seed, and the amount of fodder had been materially diminished, so that the estimate made then, that, had it been cut before frost, not less than twelve tons would have been harvested, is not improbable. The seed was sometimes obtained clean and sometimes in the chaff, each seed being surrounded by a sort of bristly envelope. The naked seed is somewhat top-shaped, and very small, of about the color of Timothy seed. It was sown in rows or drills, twenty inches to two feet apart, about ten seeds to the foot. It made very slow growth, and seemed unpromising at first, but when the weather became hot, the main stem and tillers shot up very rapidly, until it stood eight to ten feet high, and astonished every one by the immense amount of fodder which a piece of land would produce." In view of the general interest now taken in the Millets, Durra, Guinea grass, and similar fodder crops, we give this, as we have given others, with the best information we can obtain concerning them. Fodder crops of various kinds, in this country, come in competition with Indian Corn, which, though an excellent fodder plant, is not so perfect that our farmers are not warranted in assuming that there can be none better. Should this come into favor, our dealers can readily have the seed grown for them in the Southern States.

EGYPTIAN OR "PEARL" MILLET.—(*Penicillaria spicata.*)

A New Double White Violet, "Belle de Chatenay."

It is probable that no one, in looking at the flower of the new double violet, Belle de Chatenay, itself, or its engraved representation, apart from the leaves, would recognize it, at first sight, to be that of a violet. The flower of the single violet is characteristically and regularly irregular, while in this double variety all semblance to the usual structure of the violet is lost, and we have in place of the normal flower a mass of petals heaped up upon one another to make a "full double." This novelty was introduced by M. L. Paillet, of Paris, the past summer. The attempts of the French nurserymen and florists to give us their catalogues and descriptions in English are sometimes very amusing, and, though M. Paillet succeeds better than some of his countrymen, his description is of the French—Frenchy. He says: "This new Viola is sent out for the first time by me the present season, and is the beautyfullest variety known. The flower is very large, about one inch and third in diameter, very double petals, very well set in order like a double camellia flower, pure white and the border of petals embroidered with red purple lilac. This variety is very hardy and will be a precious plant for forcing or market purposes. Variety extra." After all this description, the concluding "variety extra" seems as much an anti-climax as Mr. Paillet's countryman's comments on a sunrise at sea, when he exclaimed: "Voila! tres grande! tres magnifique! very good!!" Still, in spite of the producer's enthusiasm, we incline to the belief that the plant will warrant it. We have received a specimen from the greenhouse establishment of Henry A. Dreer—an establishment in which, by the way, a worthy son sustains the reputation of our lamented friend, his father, in quietly introducing choice novelties.

DOUBLE WHITE VIOLET, "BELLE DE CHATENAY."

Aside from the growers who supply the demand of cities—and it is a large one—for violet flowers, the choice varieties of the European fragrant Violet (*Viola odorata*) are not much grown. Beyond a clump of the common single form in a shady place, to give its sweetest of all flowers in early spring, we see but little attention given to the violet in private gardens. With but little trouble, one may have violets from January until in May they bloom in the open ground. Plants, obtained by setting out runners in spring in rich soil, and giving all the water they need in dry weather, may be set in early autumn in a common cold frame. Allow them to grow until winter comes, then fill up with leaves, put on the sash, and a shutter over that. When flowers are wanted, remove the sash, and take off the leaves, and if the plants were strong, and well furnished with buds, they will begin to bloom in a week or two. Of course, the plants must be treated like others under glass, and have abundant air on mild days, and water as needed. A frame of three sashes, with boards to separate it into three parts, may be uncovered, one sash at a time, at intervals of two or three weeks, and thus keep up a succession of these most charmingly fragrant and universally popular flowers.

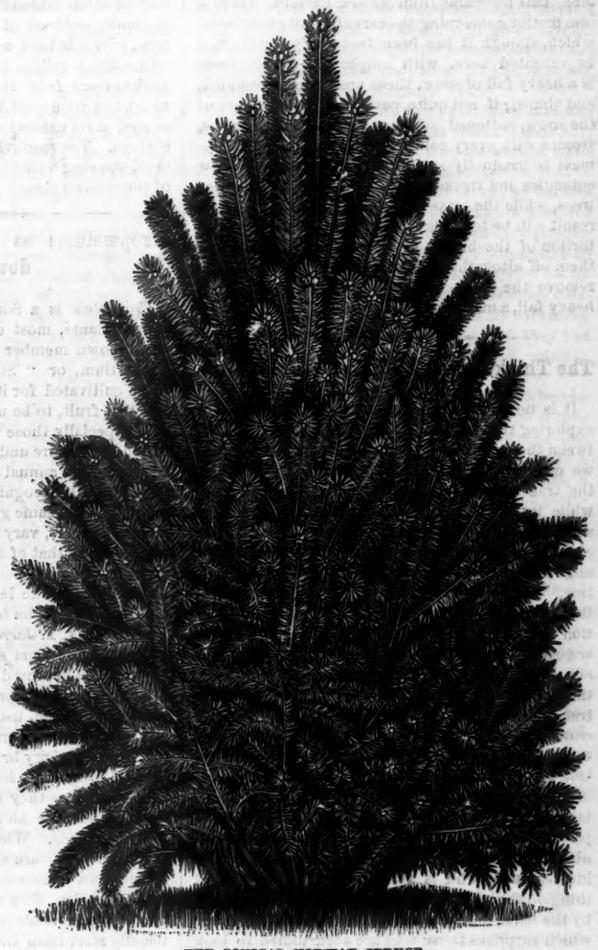
THE ONION MAGGOT.—A correspondent of the "Journal of Horticulture" (London) advises the use of hot water, "a little off the boil" to destroy the onion maggot. This he says, if taken in time, is effective, but if the maggots are not attended to before they have eaten their way into the substance of young onions, and are thus beyond reach, neither this nor any other application will be of use. When we last spring mentioned the use of hot water to kill the cabbage worm, and advised its trial, we received a letter of protest from a Canada correspondent. This gentleman, who thought our publication showed a lack of the proper knowledge of the relations of heat to plant life, may now turn his attention to the mother country, where they are so lacking in "common sense" as to use this very old method of killing several kinds of insects.

THE THICK-LEAVED ELM.—(*See page* 22.)

Small Evergreens for Small Places.

Under the heading here given, we, in November last, called attention to the folly of planting evergreens, which in a few years will become forest trees, in front yards, on small lawns, or other places were the trees, when even half grown, will be found altogether too large for the situation. An example of this is to be seen in a village through which we frequently pass. The front area, scarcely 10 feet wide, hardly merited the name of a yard. Years ago this space had been ornamented by two little White Pines, and very prettily they looked, no doubt; for it is difficult to find a more graceful little tree than a well-grown White Pine about five or six feet high. But these pines would not stay small, and when we first knew them, had grown as tall as the brick house, against which they stood in a sort of halved state, for their branches could not develop in that direction, and there they stood, two great green fans, quite hiding the house and shutting out light and air from the windows. Recently this, as sooner or later happens to all this ill-advised tree-planting, came to an end, and these trees, set out with so much care, and regarded for a few years with so much interest, are now kindling wood. In these winter days, when all prudent planters are thinking over their plans for next spring—and by planters we include those whose grounds are measured by square yards and rods, as well as those who reckon by acres, the smaller places requiring much more thought than the large ones—it is all important to look beyond the immediate effect, and consider what will be the condition of the trees 10 or 20 years hence—not only with respect to evergreens, but to deciduous trees also. Those not well acquainted with trees, can readily learn from books the size to which the different kinds will reach when full grown, and if the size of the place is such that the well-developed tree will be too large, do not plant it. There is no greater fallacy than that which leads to the crowding a place with young trees, for immediate effect, with the idea of cutting out the superfluous ones when they become crowded. The idea is a capital one—the trouble is, people will not carry it out. If one who has planted the trees really loves them, and has no place to which he can transplant his surplus, he will hesitate to put the axe to those of which he has watched the growth for several years, and though his judgment tells him that it will be better for those that remain to cast out one half, in fall he puts off the cutting until spring, and in spring he finds a ready excuse for postponing it until the next fall, and so it goes on, the trees grow up as a thicket, and the beauty of the whole is spoiled. It is easy to find examples of this mistake in all parts of the country. Fortunately for owners of small places, there are trees especially suited to them. If they put off their selection until planting time, and then send off a hurried order, they are likely to be dissatisfied with the results; but if one begins well beforehand, and devotes the time to it that is due to an undertaking, the results of which are to last for a life time, and for many years to come are to be a source of pleasure, or its opposite, to not only himself but his neighbors and the stranger who passes by, there will be no difficulty in finding both deciduous and evergreen trees and shrubs exactly suited to his place, however small or large it may be. In the article in November, we mentioned some of the most desirable small growing evergreens. In looking about our own grounds to see what evergreens, after ten years planting, seem to us the most serviceable for small places, we find two of the Norway Spruces to possess most excellent qualities. In nurseries, where evergreens are raised from the seed by thousands, or millions each year, an occasional seedling will be found, which is so different from the typical form of the species, that the quick eye of the cultivator will notice it, and set it apart from the rest to test its merits. The Norway Spruce (*Abies excelsa*), being here and abroad one of the most popular of evergreens, has been largely raised from seed, and has, of course, produced a number of seedlings so strikingly unlike the usual form, that they have been continued in cultivation. The catalogues give some 20 named varieties; some of these, like monsters among domestic animals, should have been squelched at birth; but among them are forms, which for certain uses are far superior to the usual one. The variety called *Gregoriana*, or Gregory's Spruce, was a shapely little tree when just out 10 years ago; it is not now so tall as one's head, and a model of sturdy vigor, it being very dense with branches, upon which the leaves are smaller than in the ordinary form, and of a somewhat bluish green. There is nothing dwarfed or stunted in its appearance, but it manages to keep obligingly small, and grow but slowly. Another variety of the Norway is called *Conica*, or the Conical Spruce. This we have not had so long as the other, and can not compare the two for rapidity—or rather slowness—of growth. This, of which we give an engraving, has remarkably upright branches, while those of Gregory's Spruce are spreading; its leaves are longer, and of a lively yellowish green. Messrs. Saml. B. Parsons & Sons, Kissena Nurseries, Flushing, (L. I.,) N. Y., from whom ours was procured, state that it is one of the most popular of all the small evergreens. We are not surprised that this should be so, as its exceedingly neat and compact habit, and its pleasing color, joined to a very dwarf stature, all make it a desirable small evergreen for small places. Those who care for oddities will be gratified with the variety of the Norway Spruce known as *pendula*, or Weeping Norway Spruce. Our specimen has been growing some 6 or 7 years, and does not appear to have increased much in

THREE-COLORED TROPÆOLUM.—(*See next page.*)



THE CONICAL NORWAY SPRUCE.

hight. It has apparently no aspirations, all its tendencies being earthward; no sooner does a shoot start than with a sort of arboreal depravity, it at once turns downwards, and while in this manner it builds a broad fountain-like mass of branches, its upward growth is very slow. While we can not commend this, if one is to set a very few trees, it may well find a place in a collection of moderate size. This also came from Messrs. Parsons. There is one matter concerning the care of small evergreens, which, though it has been frequently stated, may be repeated here, with emphasis. When there is a heavy fall of snow, these are quite surrounded, and almost, if not quite, covered. The surface of the snow, softened by the sun's heat, and by rains, freezes with every cold spell; and all the while the mass is gradually settling. If the surface snow entangles and freezes around the branches of these trees, while the mass at the same time settles, the result will be to disfigure the tree by a severe distortion of the branches, or what is worse, to tear them off altogether. The only safe method is to remove the snow from around them after every heavy fall, a matter of little trouble, if done at once.

The Thick-leaved Elm, Ulmus Crassifolia.

It is now more than twenty-five years since, in exploring that part of Western Texas, that lies between the San Antonio and the Pecos Rivers, that we came across a remarkable Elm. The habit of the tree was more that of an Oak than an Elm, while its dense foliage was made up of leaves so small and thick, and so unlike those of our Northern Elms, that, had we not found the fruit, we might have been in doubt as to the kind of tree. Upon examining the specimens, after our return home, we found that Nuttall, in his continuation of "Michaux's Sylva," had figured and described it (in 1842) as the Opaque-leaved Elm, *Ulmus opaca*, forgetting (as he not infrequently did), that he had already, (in 1834), described the same tree, in his "Flora of Arkansas Territory, as *Ulmus crassifolia*—the Thick-leaved Elm, which is the oldest name, and must be adopted. Nuttall first found the tree upon the upper waters of the Red River, where, in a richer soil than that of Western Texas, it attained a medium size, and afforded a dense and especially acceptable shade. Different persons recognize trees by very different characters. The lumber man, who is among trees, as a general thing, in the winter only, learns to distinguish them by the bark, and this he will do with an accuracy which surprises those who are accustomed to look to other characters. The landscape gardener studies the outline that trees make against the sky, the angle their branches form with the main stem or trunk, and the character of the spray. The botanist is too apt to disregard the points observed by those skilled in woodcraft, and those who study the picturesque effects of trees, as these characters are only learned by long familiarity with the objects, and can not be definitely recorded in descriptions in such a manner that others may make use of them. While the botanist notices any striking peculiarity of the habit, or the bark of the tree, his main dependence in identifying species is upon the leaves and the flowers, and on the fruit in genera. While we have often been astonished at the accuracy with which woodmen will tell a tree by its bark, we have in turn as much surprised them by telling the tree from the mere form of the leaf, a character which they do not take into consideration. With this digression, we will say that the leaves of this thick-leaved Elm, are, including their short stalks, only about an inch in length, and half that in breadth, varying somewhat in size in trees in different localities; they are unequal, *i. e.*, with one half larger than the other; very deep green, somewhat shining, and roughish to the touch on the upper surface, and paler below; the margins serrate with blunt teeth. When very young, and but partly developed, the leaves are thickly covered with down. The very small flowers are in clusters of three or four in the axils of the leaves, appearing late in the season, and the small, deeply-notched, and downy fruit ripening in autumn. This species is mentioned here as one concerning which it is desirable to know more, our interest in it being increased by the fact that a small specimen in our grounds, near New York, much to our surprise, endured the past rather severe winter without injury. Should this not prove to be an accidentally exceptional case, and the tree survive the present winter, there will be good reason to hope that it may be safely added to our collections, as it may, no doubt, to those of England and Southern Europe. By this time, settlements must have extended to the localities of this tree, and we shall be glad to learn from those who live where it grows as to the nature and uses of its timber, and how nearly, in its native localities, it comes to be an evergreen. The engraving is from a herbarium specimen, showing a small twig, with leaves and fruit of the natural size.

Tropæolums as Greenhouse and Window Plants.

Tropæolum is a South American genus of very showy plants, most of which are climbers. The best known member of it is the common garden Nasturtium, or "'Sturtion," (*Tropæolum majus*), often cultivated for its showy flowers, and for its pungent fruit, to be used for pickling. Other species, especially those with tuberous roots, are only suited for culture under glass, and are so unlike the coarse garden annual in foliage and flower, that one would hardly recognize them at first sight as belonging to the same genus. The "bulbs," or more properly tubers, vary in size from that of a boy's marble up to that of an English walnut, and are offered by the seedsmen with their assortment of autumn bulbs. The leading species are the Three-colored, *Tropæolum tricolorum*, the Blue, *T. azureum*, Jarratt's, *T. Jarrattii*, and perhaps one or two others. The tubers should be potted as early as they can be procured, by September if possible, in light rich soil, and provided with a trellis, or some kind of a frame, usually of wire, or of rattan, to run upon. A very pretty effect is produced by using a very twiggy branch, or the top of a young tree, of some kind, instead of a regular frame. In the greenhouse they may be trained to a wire fixed for the purpose along the rafters, for the freer growing kinds. When the shoots first start from the tubers, they are exceedingly slender, but little larger than a common horse-hair, and before the leaves develop, they make so little show that they may be broken unless care is taken. Several shoots usually start from the tuber, and should be trained out separately to the support, at once, else in a few days they will entwine around one another, and become a tangled mass, from which it is almost impossible to extricate them. When once fairly started, the vines grow rapidly, and may be helped with a little weak liquid manure. They do not begin to flower until the support is well covered with foliage, but if potted early, they will be gay with flowers from March until May. The engraving, given on the preceding page, is of the natural size, from a spray of the Three-colored Tropæolum, the flowers of which are scarlet and yellow, tipped with black in unusual and brilliant contrast. They will flower well in a temperature of 50°, and with care will make satisfactory window plants, but they are very sensitive to cold, and any thing like frost will kill them outright. When done flowering, the foliage should be kept growing to mature the tubers, and when this shows signs of fading, water should be withheld, and the tubers allowed to dry off. They may be kept in the pots in the dry earth until time to repot the next season.

A Wonderful Prairie Flower, "The Cockatelle."

BY PETER HENDERSON

The vender of that wonderful novelty, the "Cockatelle Flower," is "Comanche George," as he calls himself. George was one of these terrible fellows, a Texan scout. To dispel all doubts on this point, the garb of the plains is so necessary to him, that even in the streets of New York, while selling his seeds of the "Cockatelle," his hunting shirt and boots, and that leathern belt, so suggestive of bowie-knives and revolvers, still clothe the stalwart form of "Comanche George." In one of his many wanderings he discovered, on the banks of the Brazos, the "Cockatelle," a flower at once so surprisingly beautiful as to subdue the savage instincts of this man of war, and convert him at once into a peaceful seedsman. He describes this wonderful flower as vieing in colors with any rainbow, the foliage simply grand, and the odor, surpassing that of the Rose and Jessamine combined, is wafted over the plains for leagues. After securing the seeds, he made straight for Washington, and gave the officials of the Botanic Garden the first offer, but through jealousy, or something else, they would not purchase, so George wended his way through Baltimore to Philadelphia, and easily found more appreciative customers. When he reached New York the demand had been so great, that he thought of raising the price from 5 seeds for 25c., to 1 seed for 25c.—so he said—as he wished every man and every woman to be able to feast their eyes (and noses too) on this Texan wonder.

We saw him some time in March, and either because our quarters were scarce that day, or we, too, were jealous of this formidable rival, we failed to secure seeds. But we have seen the products of these seeds in the possession of several of our friends, during the summer. There must have been something wrong in cultivation or climate, for the wonderful flower of the Texas prairies, when transferred to our colder region, is not much of a flower at all, and as for odor—but that is so much a matter of taste (or smell) that it may be as well not to express an opinion on that. In fact, "Comanche George's" flower of rainbow hues, turns out to be nothing more and nothing less than common garden *Okra*, or *Gumbo*. Not a few of the scout's customers are ready to assert that he was no scout at all, nexer saw Texas, and that he had had a heavy contract with some one for Okra seed. When last heard of, he was working his way Eastward, slighting no town of any size worth "doing." He no doubt will turn up in some other section with a fresh supply of "Cockatelle" seeds for the coming spring, and your Eastern readers should be on their guard. It is hardly to be wondered at, that this plausible scamp found so many victims, when we know that not a few "professionals" were unfortunate enough to exhibit to friends plants of the "Cockatelle," the seeds of which they had purchased of "Comanche George." I doubt if there are any fields for humbug so varied as those provided for the amateur horticulturist. Year after year, as regularly as spring comes, the swindlers, now known as the "Blue Rose Men," plant themselves in the most prominent streets of nearly every city of sufficient size in the country, and openly sell what the merest tyro ought to know are impossibilities in fruit and flowers. They don't even go to the trouble to vary the names of their frauds, but the same colored plates of Blue Moss Roses, Blue Dahlias, and Blue Gladiolus, and of strawberries, (growing on trees), as large as turnips, do duty just as they did 10 years ago. A new crop of victims comes up every season, and like gudgeons, swallow these most thinly baited hooks. The other day, on Broadway, at Trinity Church, an old colored man had taken up a position against the fence; at his feet lay coiled a few dozen of spiny briars. I stopped and asked him what they were, and the price, "Dems Rosy bushes—de only Rosy bush dat am fragrum, and dat bloom all de time—jes 25 cents a piece."—"Where did you get them?"—"From de boss, and he get dem from Yourup." The "Rosy Bushes" that "the boss" had imported, were not at all "Rosy," but just the common "Green Brier" or "Cat Brier," *Smilax rotundifolia*, to be found in almost every thicket, or along nearly every neglected fence row in the country, North and South. Some industrious scamp had dug these from the Jersey swamps, and had given to this simple son of Africa to sell as "Rosy bushes." ["Comanche George" has at last come to grief, he has fallen into the hands of an interviewer, and, in an unguarded hour, told who were his patrons, and

his opinions of them. As a result a large number of ladies and gentlemen—people who "think no small beer" of themselves, find their names catalogued in a Sunday paper as victims of this swindle, the amounts out of which they were fleeced, and the rascal's accounts of their eagerness to be humbugged. Probably these people will recollect what we have often told them, that really valuable plants are never introduced in any such loose way. If a traveling vender or other unknown person offers a seed or plant of any kind as a novelty, be sure that here is a first-rate chance to be humbugged. ED.]

Too Much Shade for Health.

The business of planting shade trees is not perhaps overdone. Ornamental trees, the Maples, Elms, Oaks, Tulip trees, and others, certainly add much to the beauty of our village streets, and we should hardly know how to spare the Lilacs, the Wistarias, the Honeysuckles, the Hawthorns, the Wigelias, and Rhododendrons, and other flowering shrubs, that thrive in the yards, and cluster around our windows. There is no occasion yet, especially in the newer villages, for the tree-planting societies to disband. Country roads still sadly lack ornament and shade. But the tree-planters should certainly have their attention called to the abuse of shade. Such an unusually wet season as this in the East, showers falling almost every week, all through the early summer, intensifies the evils of our over-shaded streets. In many of those old towns which are considered the glory of New England, the trees have been planted so near together, and so close to the house, that sunlight is almost wholly excluded from the dwelling, except at mid-day. Trees are not only on all sides of the house, but they have been planted so thickly, that the branches interlace, and no sunlight falls beneath. Elms that require 60 to 100 feet space, for the full development of their branches, are planted within 20 feet of each other, and Maples, that need nearly as much room, are allowed but 10 or 12 feet. It is gloomy and damp under such trees until mid-day, and the moisture steals into the darkened sleeping-rooms of the house. The carpets and furniture grow moldy, and the people who dwell in these over-shaded houses, grow thin and pale, dyspeptic and consumptive. If New England boasts of her tree-crowned villages, she also mourns over the largest proportion of consumptives in her death-list. These villagers want more sunlight and a dryer atmosphere. The dwelling should have the full benefit of the sun, and a free circulation of the air upon every side of it. The remedy for these overcrowded streets and yards is the axe. Thin out until every tree has room for full developement, and a margin of sunlight beyond. It will make handsomer trees, and healthier men. We protest against the abuse of shade.

CONNECTICUT.

Striking Cuttings in Water.

Just now some of the European horticultural journals are discussing the method of striking cuttings in water, as if it were something new. It has been in use for a long while in this country for cuttings of Oleander, Laurel, and other hard-wooded plants, and what is called the "Saucer System" of propagation, is scarcely different. In the "Saucer System" sand is used, but with so much water that it is in a state of very thin mud. The cuttings are placed in this very thickly, and exposed to full sunlight, taking care to keep up the supply of water. The French cultivators have used water for cuttings of very soft-wooded plants, such as Begonias. It is apparently much better for summer work than for winter, and in this, as in the saucer propagation, it is necessary to give the plants full sun-light. They find that bottles of clear glass are better than those of colored glass, and with soft-wooded cuttings, but a very small portion of the lower end is immersed, a precaution necessary to prevent decay. This is a method which may afford the amateur much amusement, and may be useful to those who only wish to make a cutting or two, but the professional florist will hardly care to bother with it.

THE HOUSEHOLD.

☞ *For other Household Items see "Basket" pages.*

Home Topics.

BY FAITH ROCHESTER.

Keeping a Diary.

I find it of some advantage to keep a small diary each year. A journal is a different thing. In the latter you may spread yourself to your heart's content, but a diary is for business. It should be kept up pretty closely, or be written in every evening, if one would avail himself of all its advantages. Anything will do for a diary, which gives clean space for writing, but a little pocket-book, made for the purpose, with spaces marked for each day in the year, is best. Three years ago I had no ready-made diary when the year began, so I used a small blank blook, making the dates as I wrote. But this got us into a "pretty scrape" one pleasant summer day. We called it Saturday, and Mr. R., who had been at home, working on the farm for several weeks, had determined to go back to the city, to work that paid better, (I am ashamed to say it in an Agricultural journal), on that very Saturday. When a neighbor, who seldom left his daily work in the field at this season, came to the door in his clean Sunday clothes, and loitered as though quite at leisure, I said, "I wonder if Mr. J. hasn't lost his reckoning, and taken this for Sunday." We thought it must be so, and I related how amused my mother and I had been the year before to see my father dress himself up leisurely one Saturday morning, and sit down in the shady door-way of the same house we then lived in, to sing his Sunday-school song book through, in pleasant memory of the days gone by when he was a S. S. Superintendent, while his usual daily work was waiting quite urgently for his care. A little later I saw my neighbor's wife, also dressed up for Sunday, and when I asked her about it, she assured me that it *was* Sunday. The Almanac could not help us out, but I thought my diary would. But that only confirmed my error, because I had been several days behind-hand, and in "writing-up" lately, had

Skipped a Day.

We then talked it over together, but to the other members of the family, one day had been much like another all through the last week. Suddenly we remembered an important event which I had not chronicled at all, and in slipping that in between the other days, we found ourselves in the midst of Sunday, sure enough. I believe Robinson Crusoe never lost track of the time, but I wonder how he could do so. I have had to go to my diary to help our folks to a knowledge of the time more than once, and we have even found by that we were a week behind in the days of the month.

Of course people who send children to school, or who live in the neighborhood of churches, or who have daily association with neighbors, are not likely to lose track of the days of the week or month, but if you think it ridiculous to do so in any case, you should be placed as some readers of this paper are, out of sight of neighbors or a public road, and out of convenient reach of schools and churches.

About Keeping Accounts.

I am inclined to agree with Mrs. Stowe's Nina as to the futility of keeping accounts. It does not bring the money back after you have spent it, and I am sorry to say that my accounts seldom add up and balance properly, but the daily memoranda in my diary, of money received and spent, has saved me from loss more than once. When I write regularly in a journal, I note down all letters received and sent, and I turn to the diary to see whether it is time for a reasonable expectation of an answer to a business letter. I examine it, too, to learn how long a sack of flour, or a cord of wood, has lasted, in trying to make calculations about family expenses; also to learn how long since the last rainy or sunny day; and if one of the children should get sick, I should wish to trace back, through the various entries in my diary, the different steps of the disease from the prolonged exposure to cold or dampness and the taking cold, or the over-dose of sweet things and resulting stomach ache, to the actual sickness, in order that I might learn how to avoid such trouble in future. The diary is an important ally of the memory.

Beginning Poor.

A young woman asks whether I think it would be safe and prudent for her to marry "John," when they have less than three hundred dollars to start with. That depends. I decline to give personal advice in this case, though the person asking has my hearty interest and sympathy. The subject will allow of some general remarks.

What position in life do John and Mary aspire to fill? What are their social aims and ambitions? If they must begin as though they were rich, while they are really poor, of course it is not prudent to marry. But there are thousands of happy families where a start was made with less than a hundred dollars. Michelet says that two can live cheaper than one, and a young lawyer once demonstrated to me how he was able to save more from his income since his marriage, while living far more comfortably and happily, than before. But his wife knew how to make the most of everything, and they had sufficient means at first to set up house-keeping in a pleasant and comfortable manner.

Two people who love each other can begin house-keeping with a very small outlay of money, if they are so disposed. They need only to furnish one room, and that with little outlay of money. A cook-stove, a bed, a table, two or three chairs, a few dishes, a lamp, a wash-basin, a tub, and wash-board. These are about all the articles of furniture actually necessary to begin with. Then the

Saving must Begin.

and out of the savings there can soon be purchased other useful household articles, until the establishment is comfortably equipped. I know from experience that carpets and curtains (other than newspapers—and perhaps I should have set down a good newspaper among essential articles), are not among the necessaries of life in all circumstances. When they must be had, cheap ones can be found to answer the requirements of utility and beauty. If a young couple, with very small means, begin in this way, and carefully keep out of debt, paying for everything as they buy it, they will find a satisfaction in their purchases which they could never have in the possession of treasures balanced by debt. In order to save anything from the weekly or monthly earnings, there must be careful economy about food and clothing. The most nourishment from the least money must be the aim, and every *leak* should be stopped, or all outlay for that which brings no real advantage in return.

Beginning Arithmetic.

Some mothers who teach their children at home, find it more difficult to bring them along properly in arithmetic, than in any other branch. This has been the case with me. Geography, with a globe and maps, almost teaches itself. A mother, with a mind at leisure, can manage the arithmetic well enough, I suppose. After the little one has learned to count, it can be taught to put numbers together, either by using a regular Abacus or counting frame, or by using beans, peas, or marks on a slate. The mother can make for it little problems of the simplest character, leading it along gradually through addition, subtraction, multiplication, and division; teaching it to read and write numbers, and preparing it to use a book intelligently when it has learned to read well enough. I have never found a book that suited my needs until a friend sent me lately a "Table Book and Introductory Arithmetic, by Lydia Nash." This has not a word too much, and it has quite enough. It was compiled by a practical teacher to aid other teachers in drilling their pupils in the simple rules of arithmetic. There is nothing to commit to memory except the simple tables of the four fundamental rules, and no one need require a child to repeat a table, if disposed to teach addition, subtraction, and even multiplication, in a more practical manner. But here the tables are arranged in the best manner, each one followed by a "skipping-around" table. After the tables, we have reading and

writing of numbers, and then simple, graded examples in addition, subtraction, multiplication, and division. There are no rules and no explanations, because the young child, for whom this introductory book is designed, is supposed to depend upon its teacher for oral instruction and explanation. Here is simply something to *do*, in the doing of which the learning comes of itself. This is the modern theory of learning rules: learn to *do* a thing, and then tell us how you did it, or how it can be done. It was the old way to make the child first painfully commit the rule to memory, whose sense it could hardly see, until it afterwards learned how to apply the rule by familiarity with examples. I don't know where the book mentioned above can be obtained, but mothers who see and like the idea, can act upon the same theory by using any book, and omitting rules and explanations (or not requiring that they be committed to memory, but teaching *how*, and explaining *why*, in her own way), or without using any book at all.

The Spoiled Bread.

I thought the fire was going down, and I would not need any more for two hours; so I set the bread-pan in the oven, with the batch of kneaded dough in it, and went up-stairs to work. I was detained longer than I expected, and when I came back to the kitchen, there was a hot fire (kindled up just before I set the pan in the oven, it seems,) and I supposed that my bread was spoiled. I pulled off the upper half of it upon my floured-kneading board, and picked out the remainder, which was half baked, as carefully as I could, and set the rough bits on a baking-pan back into the hot oven. At noon, when the children came hungry from school, they pounced upon these crusty brown-baked bits as something quite rare and good, either alone or in milk, and so not any of that batch of bread was wasted.

Simple Dessert Dishes.

Almost everybody knows "Brown Betty," made with chopped apples and bread crumbs. "How came it to be called "Brown Betty?"—I know how "Joanna" came to be called so. My great aunt Joanna told mother how to make it, a plain, but good cake, made with some milk, without eggs, and from being called "Aunt Joanna's cake," it came to be "Joanna." I turned aside right here to ask my mother, now sojourning with me, if she remembered how to make

JOANNA CAKE.—Here is the rule: One cup of loppered milk, one cup of sugar, one tablespoonful of butter, half teaspoonful of soda. Flavor with nutmeg, or spice to suit, and use flour to make a rather stiff batter.

This cake would do well to use for a dessert, which may be made of any plain cake, with canned berries. Split open the warm cake, and spread upon each half canned or stewed berries of any kind, laying one layer of cake, when spread, above the other. A plain sponge cake is very nice treated in this way, and makes a rich dessert when served with sweetened cream.

A common cream short-cake, split as for a strawberry short-cake, and dressed with sweetened cream, makes a delicious dessert.

To come back to "Brown Betty." This can be made with almost any kind of fruit. Not long ago, a recipe for Brown Betty, made with pie-plant, appeared in the Basket items of the *American Agriculturist*. The idea is to place alternate layers of crumbed bread (buttered or not) and fruit in a pudding dish, and bake or steam the whole. The other day, I used up a quantity of dried peach sauce, which had become rather tiresome, by making a dessert, which gave satisfaction, in the shape of

DRIED PEACH BROWN BETTY.—A layer of peach sauce in the bottom of the pudding-dish, a layer of bread crumbs about an inch thick, sprinkled with sugar; another layer of stewed peaches, and a second layer of bread crumbs and sugar, with enough thin, sweet cream poured over the top to wet the upper layer of crumbs. Bake from half an hour to an hour, according to the heat of the oven. This was eaten with good milk, but sweetened cream would not have spoiled it. A similar plain every-day dessert can be made with dried apple sauce.

A Hanging Basket for a Cool Room.

Mrs. S. J. J., Bergen Co., N. J., wishes to know how to fill her hanging basket with plants suited to a cool room; the house is moderately warmed throughout, and while the room in which she would place the basket is seldom very warm, it never gets cool enough to freeze. It is quite late

BASKET WITH IVY AND HARDY FERNS.

in the season to start baskets of this kind. We might tell our correspondent to send it to a florist's to be filled, but the chances are that most florist's plants, being accustomed to heat, would fail to flourish in a cool room. If Mrs. J. can get from a florist a couple of strong vigorous plants of European Ivy, the rest will not be difficult. Most florists keep Ivy in pots, as there is considerable demand for it during the holidays, and we notice that it is generally on sale at all seasons in the stores of the city florists. But you can, no doubt, get the plants at the florist nearest to you. For the rest, you had better go to the woods. It will not be difficult to find in almost any rocky ravine, or wooded hillside, our largest Evergreen fern, the Evergreen Shield fern, *Aspidium acrostichoides*, a vigorous species, a foot or more high; take up some clumps of this. You will be very likely to find in the same woods the *Mitchella*, or Partridge-berry, also called One-berry, as its fruit is produced by two flowers. This is a capital plant for a cool place. Some sheets of moss, such as is found at the lower part of trees, will be useful. Of course, you can not get these if the ground is frozen, any more than you can soil from the woods, with which (and some sand) to fill the basket. If lucky enough to secure all the materials, set a clump of the fern in the centre, an Ivy opposite each half of the handle, and bits of the Partridge-berry around the edges, so that the vine will hang over the sides of the basket. Probably each Ivy plant will have several stems; train one or more of these around the handle of the basket, and the others to the outside of the basket itself, loosely tying the stems in place with coarse thread. When all are planted, and the surface of the earth leveled, then place on the sheets of moss to quite cover the soil. The moss can be torn or cut into bits to fill spaces between the larger pieces, and all made to look like an entire sheet of green. Press the moss down firmly, to be sure that it will be in close contact with the earth. The engraving shows a basket we filled with just these materials some while ago, and we never had one, even when furnished with expensive exotics, that gave us more satisfaction. These are all shade-loving plants, and do perfectly well in a cool room, where there is but little direct sunlight. Of course, the soil must be watered when it needs it, and the Ivy will be all the healthier if its leaves are sponged occasionally, to free them from dust, and if possible a good showering should now and then be given to the whole basket.

A Home-made Work-Table and Basket.

In former volumns we have given quite a number of illustrations of articles of furniture to be made from available materials, and we now add one more to the list—a combined work-table and work-basket, from a design sent some time ago. This home-made furniture, if well put together, will be quite as serviceable as that purchased from the cabinet-maker and upholsterer, and may be made at a cost quite insignificant as compared with the other. In the matter of appearance, there is a cosy home-like look about these home-made articles, that is much more in keeping with the surroundings of those in moderate circumstances, than any showily upholstered work of the shops. Those of our readers who find themselves, as many of them do, at a distance from cities, can, by the exercise of a little mechanical tact, provide themselves with articles of use and comfort, which they could not otherwise obtain. A barrel, and a few pieces of lumber, will furnish the materials for the frame-work of this table. The heads of the barrel answer for the base and the cover; these being in two or three pieces, are fastened together by two strips nailed on in the manner of cleats. To the center of one of these fasten an upright standard of a convenient hight, as in figure 1; this may be done by putting several strong nails through the base, and it would add greatly to its strength to place two of four short braces between the base and the standard; these are not shown in the engraving. The strongest and best hoop of the barrel is selected, and four braces, of staves split in halves, or other material, are attached at half way up the standard, one end of each being firmly nailed to the standard, and the other end to the hoop. The frame being finished, as in figure 1, it is to be covered with such material as may be desired, or may be at hand. Glazed cambric of some bright color, covered with Swiss muslin, laid on in plaits, makes a very pretty covering; but the matter of covering is one that admits of a wide variety, and most house-keepers will be inclined to utilize some material at hand. The covering should be put on with small tacks, and left full enough to allow of its being gathered in at the middle, by means of a cord or band, as in figure 2. The second barrel-head is to be covered on both sides with the material, and may be fastened by a hinge to one of the braces, or left loose. A ruffle or a plaited strip should be put around the cover, and around the top and bottom, to hide the edges of the covering material, and give a finish to the whole. If the covering is not sewed together, but the edges merely lapped over where they meet, the lower part of the table may be used to hold slippers or other articles, which may be put in through the opening thus left. If desired, the table may have casters

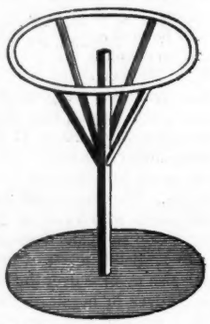


Fig. 1.—FRAME OF TABLE.

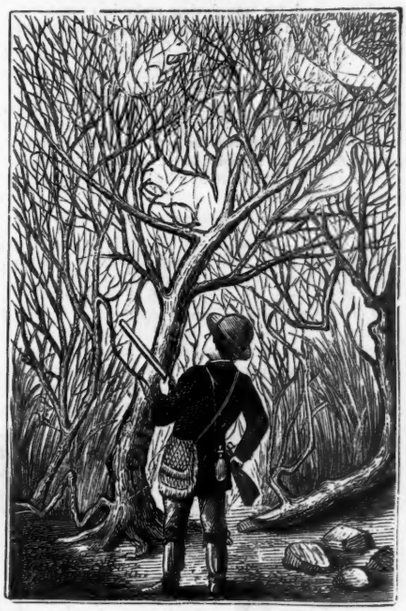
Fig. 2.—TABLE COMPLETE.

attached to the bottom. The upper half may be fitted up to suit the convenience. A single shallow bag of strong material, with an opening to allow the standard to pass through, may be tacked to the hoop, and form one large receptacle, or it may be divided into several compartments. The underside of the cover may be furnished with several pockets to hold articles, and its capacity as a work-stand may be still more enlarged by attaching a row of small pockets around the upper edge of the stand, to hold spools and other materials.

Diphtheria—What to Do.

Believing that much of what is called domestic medicine—frequent and ill-advised dosing—to do much more harm than good, the *American Agriculturist* has, as a general rule, kept its columns free from the many recipes sent as "the best thing in the world," and "sure cures" for various diseases. While we are opposed to frequent medication for every little ailing, we think that every mother should understand the general laws of health, and sufficient of diseases to know when it is safe for her to apply some simple remedy, and when the case is sufficiently grave to make it necessary to call in medical aid at once. In many cases the success of the physician depends upon his being called at once, while it is too often the case that he is not sent for until all the medical knowledge of the parents and neighbors is exhausted, and the patient still grows worse. There is no disease in which immediate aid is more imperatively demanded than diphtheria, which has been, the past season, and is now, in some neighborhoods, and even whole townships, especially frequent, and often very malignant and fatal. In one family, within a mile or two of the writer's residence, every one of a family of four promising children has been taken away within about a week. Diphtheria is eminently contagious, and every precaution should be taken to prevent it being communicated from one to another. When the disease prevails in a locality, children should be kept as much as possible from contact with others, and as persons in whom it has not manifested itself, are able to communicate the disease, all fondling of children, and "kissing the baby" by callers, should be avoided. Before there is any difficulty of breathing, there is a constant pain at the sides of the throat, and this is accompanied by very fetid breath, and the appearance of whitish spots upon the sides of the throat, (fauces), the back part of the throat, or the roof of the mouth, is an indication sufficiently strong to call for medical examination at once. The remedies employed by physicians are various, but none is so generally used, and none have been found, if used in time, more reliable than the *Chlorate of Potash*. While we do not advise any parent to assume the responsibility of treating so grave a disease as diphtheria, we may suggest how they can essentially aid the physician, and this is of especial importance to those who live at a long distance from the doctor, and where many hours must pass before he can arrive, for in this disease hours are of great importance. Chlorate of Potash, to be had at all drug stores, is a salt in small, white, scale-like crystals, which are not very soluble in water. It may be kept on hand in the form of crystals, or when the disease is prevalent in the neighborhood, it may be well to keep a solution ready for use. It takes about 16 parts of cold water to dissolve one part of the Chlorate, and it is to be used in a saturated solution. To prepare this, it is only necessary to add to water more of the Chlorate than it will dissolve. Half an ounce put into a four-ounce vial of water, will be about twice as much as the water will dissolve. As long as any remains undissolved, the solution is known to be saturated—*i. e.*, the water can take up no more. If the ordinary water is hard, use rain water. Upon the appearance of symptoms which seem to indicate diphtheria, a dose of this may be given every hour, a teaspoonful for a child three years and older, and half a teaspoonful to those under three. It is to be given undiluted, and without any sweetening or other admixture, as its taste is not very unpleasant. Drink of any kind should not be given for some minutes after a dose, as it is desirable that the solution should remain in contact with the surfaces of the throat and mouth as long as possible. Children old enough to gargle the throat, may take the dose every hour, and every half hour use the same as a gargle. This is only intended to aid the physician's treatment, and is advised only for cases in which some hours must elapse before they can be attended. When the doctor comes, tell him exactly what has been done, and how many doses have been given. Those situated quite beyond the reach of medical aid, can not do better than continue the administration of the solution every hour, day and night, until the spots in the throat begin to disappear, when their frequency may be diminished to two, and later to three hours, giving all the while the most nourishing food. This advice has the sanction of the most eminent medical authorities, but we repeat, it is only to be followed until the doctor comes, and at the first appearance of diphtheria, or what seems to be that, lose no time, but *send for medical aid at once.*

BOYS & GIRLS' COLUMNS.



No. 463.—Puzzle Picture.—Master Green has gone out on a gunning expedition. He would shoot if he could see any game. You and I can see a plenty of game of various kinds, large and small, but there is more than any of you are likely to see at first sight.

The Doctor's Correspondence.

ABOUT THE MICROSCOPE.

Last month most of you no doubt saw that the Publishers had arranged for the manufacture of a Microscope, which is to be called the *American Agriculturist* Microscope, and that it can be had on very easy terms. In offering this Microscope I know that the Boys and Girls were considered quite as much as the older people, as it will prove a great source of amusement and instruction, and is put so very low that it would seem that nearly every one who really wished to have one could get it. Many will no doubt be writing to ask me about it, and I will answer them in advance, that while it may be had for a fraction of a dollar, it is quite as good as those which cost two or three dollars, but of course will not magnify like those large compound microscopes which cost $25 to $100 or more. I have no doubt that enough youngsters will have them to make quite a large

YOUNG MICROSCOPISTS' CLUB,

and I shall try to point out, as they come along in season, the different things that you will find it interesting to examine. But this must not be all on one side, for I expect *you*, on the other hand, to tell *me* what you find, and what you see that interests you, and that my correspondence, now quite large, will be much *magnified* by the Microscope. The engravings given last month show the parts of the Microscope, but there goes with each one a sheet telling

HOW TO USE THE MICROSCOPE.

This shows how to very easily mount the little instrument on a base or stand, so that you can work more conveniently with it. Then it tells how you can fit up a few little tools that will be very convenient to have, and quite worth the little trouble it will be to make them. Then it points out a number of things that are to be seen, many which you can examine now, and learn to use the Microscope handily. Take it altogether, I think we start off

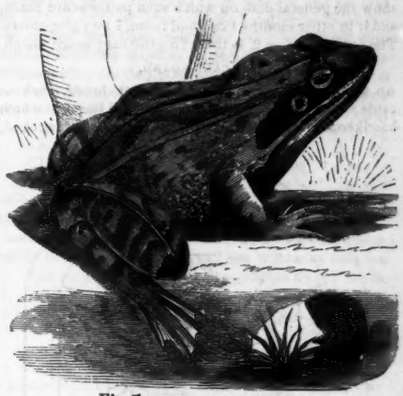


Fig. 1.—THE WOOD FROG.

WITH THE NEW YEAR

with a good prospect of having an interesting time. I expect that a large lot of new comers will join our circle—but there is room for all. The more the merrier, and there is always room for more. So tell your young friends—those who do not already belong to our circle—about the *Agriculturist* and the Microscope, and let us have as large a number as possible in our "Young Microscopists Club."

W. I. Norton, of New Jersey, whose inquiries concerning the Tree-frog, I answered some months ago, sends a

DRAWING OF A FROG.

He found the frog in the woods, and "had a friend draw a picture" of it. Now just here let me advise W. I. N., and every other boy and girl who reads this, to learn to draw. Had my young friend been taught to draw himself, he would not have been obliged to ask some one else to draw his frog. Every one who can learn to write, can learn to draw. All will not draw equally well, any more than all write well, but every one of you can, with a little trouble, learn to draw sufficiently well to be of great use. This frog of W. I. N.'s friend was not a remarkable one, but it was sufficiently accurate for me to see at once what frog it was taken from. I may have something to say

ABOUT LEARNING TO DRAW

at another time. As to this frog, I could see that it was the Wood Frog (*Rana sylvestris* of naturalists), and my correspondent is right in saying that he never saw it on trees, or near water. It is found in thick woods, preferring oak-woods, from Michigan to South Carolina. It is reddish-brown above, and has a dark-brown patch around the eye, and extending considerably back of it. It is a very active little fellow, and makes long leaps, and you must be very lively if you would catch it, as it has a way of hiding among the leaves that may surprise you. If my friend had watched, he would have found that this frog, like all other frogs and toads, no matter where they may live at other times, go to the water at breeding time, usually in early spring. As the young of all these animals is passed in the

"TADPOLE OR POLLYWOG STATE,"

they all go to the water to deposit their eggs, and then leave them, and the young which hatch from them, to shift for themselves.

CARD-BOARD WORK.

E. M. I know that making toys from card-board is a very pleasing occupation, and that making houses of card-board is even very useful, as one may learn much about architecture in making an exact model of a building. If a young person in trying his hand at one of these only learns how necessary it is to be exact, and to always work from measure, it will be a useful lesson. Some persons are so careless that they can not cut out the stuff for a simple box, and have it all come together right, while the material for such a building as the New York Post-Office was all worked out, a stone at a time, in the quarry in Maine; and when the pieces were brought to New York, they were found to go together exactly, the measure having been given with great accuracy, and the workmen having observed it. One trouble about

CARD-BOARD TOYS

is the room the patterns take up, and space is so scarce with us that we like to use it to the best advantage. However, I will give you one example now, which will show the general plan on which such patterns are made, and if in other months I can find room, I may give others. The pattern, figure 2, is that of a little card-board sleigh.

BY CARD-BOARD,

we mean any stiff paper, or thin paste-board, such as cards are printed on. You may often find boxes in which handkerchiefs, gloves, and other small wares are packed,

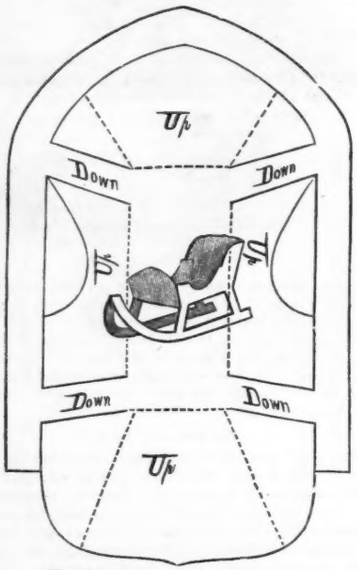


Fig. 2.—A CARD-BOARD SLEIGH.

and which are of no use to the shopkeepers when empty, that will furnish good material, and may be had for little or nothing. For nice work, sheets may be bought at the stationers. The first step is to

TRANSFER THE PATTERN TO THE CARD-BOARD,

and it may be useful to know how to do this for other things. You will observe that the pattern has entire lines, and dotted lines; wherever the lines are unbroken, the card-board is to be cut; where the dotted lines occur the card-board is only to be bent, and the directions "up" and "down" show which way. Now to transfer this pattern to the card-board. If you have some very thin note, or other paper, through which, when it is laid upon the pattern, you can see the lines with sufficient distinctness to follow them with a pencil, that will answer. If your paper is too thick, tracing paper would be useful, but as you do not wish to go to any needless expense, you can convert common paper into

A TRACING PAPER

that will answer the purpose. Take the thinnest paper you have, lay it on a clean piece of brown paper—if you use newspaper the ink will come off—and with a clean cloth apply kerosene until it is well oiled. Then with another clean cloth, remove all the kerosene that will come off by wiping. The paper should not have so much kerosene on it as to soil the hands or the page upon which it is laid. Place this paper over the pattern, and the lines will show distinctly. Keeping it in place carefully, or holding it by pins if you can not keep it steady without, take a soft lead pencil and copy the lines—whole lines when whole in the pattern, and dotted if those in the pattern are dotted. Having made this tracing, you wish to transfer it to the card-board. In this case, as the pattern is symmetrical, *i. e.*, both halves alike, all you have to do is to turn over your tracing, placing it *marked side down*, upon your card-board, and then with a lead pencil, or any smooth point, go over the lines upon the wrong side. This pressure on the lines will cause the pencil-mark—or a part of it, to adhere to the card-board, and make a faint outline, but one that may be easily followed, and when you have done this, you can go over the lines on the card-board and make them stronger by the use of the pencil, and thus get an exact copy of the pattern as it appears on the page. This pattern is a regular one, with both halves alike, but if it were one in which the sides were unlike, this would reverse matters and make what should be on the right side, appear on the left and vice versa. So to

TRANSFER AN IRREGULAR PATTERN,

and have it exactly like the original, you must work a little differently. Take the Wood Frog here shown. If you were to follow the directions already given, the frog, which now looks towards the right, would look towards the left. To avoid this, you make your tracing as before. Then turn the paper over, and go over the lines on the opposite side with a soft pencil. Then place this on your card-board, or whatever the pattern is to be transferred to, with the right side, or that on which the tracing was first made, uppermost. Then go over the lines with a hard pencil or smooth point once more, and you will transfer the lines which were put upon the other side of the tracing, to your card-board or paper, and this figure will be an exact representation of the one copied—as to right and left. Transferring a tracing may be done still more easily and satisfactorily by the use of what is called

TRANSFER OR CARBON PAPER,

such as is used in the manifold letter-writers. This is easily made, though it is smutty work. All that is required is a soft, thin paper, some lamp-black, lard, or castor oil, a plenty of soft rags, and some old newspapers. Mix the lamp-black with castor oil or lard, (in cold weather softened by placing in a warm room for a while), to a thick paste. Lay a sheet of paper upon some old newspapers, and by means of a roll of rag, smear it evenly with the lamp-black paste, rubbing it in well. Then with other soft rags, wipe off all that will come off, and then serve the other side of the paper in the same manner. When properly done, this will not soil the hands, or white paper upon which it is laid, but if you draw a line, or write upon it with a pencil or other hard point, the lamp-black will be transferred at those places to the paper below. This paper is much used for copying letters, and for transferring embroidery and other patterns. But in describing the methods of transferring tracing, we have got far away from our

LITTLE SLEIGH.

The rest is plain enough; the outside lines may be cut with scissors, but the inside lines are cut much more neatly with a pen-knife, the card resting on a flat smooth board. It will be seen that the back of the sleigh and the front or dasher, are intended to lap upon the side pieces; they may be fastened there by a little gum, or by a stitch put through the parts.

SEEING THROUGH A BRICK.

"H. T. W.," Bergen Co., N. J. This is one of the oldest optical tricks, and is quite a thing of the past. The last we heard of it, the deception was put to a good use. At the great Sanitary Fair, held in New York in 1863, to raise funds to supply comforts to wounded soldiers, a lady had found one of these "Penetrating Telescopes," as they were called, and large numbers were willing to pay a dollar into the funds of the Commission, for the chance to see "through a brick." The trick de-

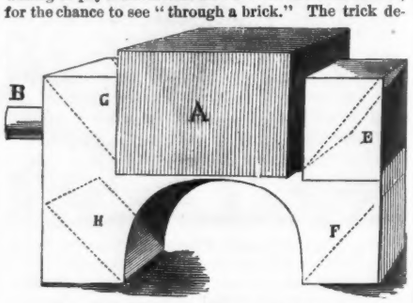


Fig. 3.—A PENETRATING TELESCOPE.

pends upon the well-known laws of the reflection of light, and can be explained by the diagram, fig. 3, which shows one form of the "telescope." One looking in at *B* sees whatever may be beyond the opposite opening, *E*, notwithstanding that the brick, *A*, may apparently be in the way. The trick is performed by

CONCEALED MIRRORS,

or bits of looking-glass, placed at the proper angle. Thus, *E* being turned toward an object, its image will be reflected from that mirror down to another mirror, *F*; from *F* across to *H*, and thence up to *C*, where it is seen by the eye placed at *B*. The instrument is made in other forms that are better calculated to deceive than this, but this shows the principle upon which all are made.

Aunt Sue's Puzzle-Box.

PI.

Het sulo hatt fresfus si grestnor hant eth losu atth icesjore.

ADDITION OF FRACTION.

1. Take two letters from a word signifying array;
2. Take two from another signifying a fruit;
3. Take two from a word, meaning—to disclose;
4. Take two from another, meaning—forfeiture;
5. Two from another, meaning—probably;
6. Two from a word, meaning—to make plain;

Add the letters together and you will see what I am trying to do. TRY AGAIN.

NUMERICAL ENIGMA.

1. I am composed of eighty letters:

My 12, 23, 49,—77, 44, 61,—18, 3, 23, 34, 38,—48, 62, 76,—6, 26, 32, 33—5, 64,—29, 70, 46, is a Proverb of truth.

My 67, 2, 20, 27, 37,—40, 63, 14—43, 19, 49, 11, 16, 32, 1,—78, 1,—65, 8, 71, 66, 17, 22, 70, 4, is a Proverb of caution.

My 28,—1, 45, 33, 42, 13,—24, 73, 32, 20, 21, 69, 75,—10, 54,—45, 50, 2, 9, 25, 29, 48, 14, 39, 8, 40,—15, 63,—18, 35, 36, —33, 66, 56, 7, is a Proverb of honesty.

My 80, 60, 28, 55, 21,—23, 72,—31,—69, 19, 79, 32, 30,—5, 62,—15, 35, 51,—4, 59, 49,—38, 53,—6, 44, 78, 23, 33, 52,—41, 2, is a Proverb of education.

My 59,—41, 8, 63, 58,—21, 73, 47, 57,—10, 27,—74, 20, 34, 19, 68, 22,—37, 70,—12, 13,—69, 35, 78, 42, 16, 29,—43, 38, 28, 40,—41, 3, 26, 31, 46,—17, 25, 69, 44, 36, 54, is a Proverb of reputation.

My whole is a Proverb of Solomon.

2. I am composed of 47 letters:

My 38, 30, 22, 23, 22, is the name of a goddess.
My 20, 8, 44, 34, is a river in Africa.
My 3, 14, 37, is a kind of fish.
My 32, 11, 2, 18, 7, we have in spring.
My 40, 33, 36, 47, is an article of apparel.
My 4, 22, 1, is a vehicle.
My 5, 28, 10, is a kind of dwelling.
My 45, 9, 18, 12, 34, 42, is a city in New York.
My 13, 19, 23, is what some people drink.
My 39, 46, 26, is a woman's name.
My 24, 30, 41, 5, 21, 31, may generally be seen on the dinner-table.
My 43, 44, 16, 6, 27, 3, 21, may often be seen on a dress.
My 15, 2, 25, 8, 29, is a strait.
My 17, 2, 20, is much used in summer.
My whole embodies the names of a god and goddess, with some information about them.

IDA S. TERRY.

3. I am composed of 10 letters:

My 1, 8, is to move forward.
My 10, 5, is a boy's nickname.
My 6, 3, 4, is to do evil.
My 3, 2, 8, 9, is very strong.
My 5, 8, 7, is something very small.
My whole is a very useful implement on a farm.

E. S. D.

4. I am composed of 12 letters:

My 3, 8, 10, is an animal.
My 11, 2, 3, 11, 1, 12, is a kind of corn.
My 5, 4, 9, 1, 2, is a musical instrument.
My 7, 1, 4, 1, 7, 7, 1, 6, is a city in South America.
My whole is a river in North America.

J. H. NOBLE.

ALPHABETICAL ARITHMETIC.

H O P E) G L A D L A N D (G R O G
H O P E
N N L A A
N D A D E
G E D L N
G D D G P
G P O N D
H O P E
L P E R

AGGIE SANXAY.

CONUNDRUM.

Why did the Colossus of Rhodes became quite small in a thunder-storm?

CROSS-WORD.

My first is in shadow but not in gloom,
My next is in grave but not in tomb,
My third is in sink but not in fall,
My fourth is in high but not in tall,
My fifth is in mind but not in heed,
My sixth is in plant but not in reed,
My seventh is in game but not in play,
My eighth is in tell but not in say,
My ninth is in look but not in see,
My tenth is in drink but not in tea,
My whole is the name of a principal city
You will find it with ease if sufficiently witty.

MAME.

TRANSPOSITIONS.

(Fill the blanks with one word transposed four times.)

That horse with the queer ——— has as ——— a ——— as I ever saw. The driver exclaimed, "——!"

S. F. T.

HIDDEN RIVERS.

1. There was a hippopotamus at the show.
2. I like a fat ham, especially if is large.
3. Be obedient to your parents and teachers.
4. Ten hundred men were slain.
5. Oh! I only sent you there to stay awhile.
6. One has a lop-ear like a rabbit.

JOHN W. WHEATLEY.

SQUARE PUZZLE.

Take seven christian names of seven letters each, and place them one below the other, so that another name of seven letters shall be revealed in the diagonal letters, beginning at the upper left-hand corner and finishing at the right lower.

DIAMOND PUZZLE.

1. A vowel. 2. A heavenly body, which forms the center of a system of orbs. 3. The American Ostrich. 4. A name. 5. The act of being contemptuous. 6. To prosecute. 7. One-fourth of five.

The center letters, perpendicular and horizontal, form a name with which we are all familiar. K. P. N.

RHOMBOID PUZZLE.

Across.

1. A bird. 2. An animal. 3. Incurring punishment. 4. A twist of thread. 5. A native of India.

Downwards.

1. A consonant. 2. A preposition. 3. A covering. 4. Animals. 5. Liquors. 6. A value. 7. To cut short. 8. None. 9. One of many. NUTMEG.

ANSWERS TO PUZZLES IN THE NOVEMBER NUMBER.

METAGRAM.—*Stream*—from which may be made the words Sam, east, steam, tean., mare, ram, tame, rat, tea, arm, sea, tar, mast, ease, mate, star, (Mars), rest, stare.

TRANSPOSED AVIARY.—1. Goldfinch. 2. Humming-bird. 3. King-fisher 4. Nightingale. 5. Starling. 6. Pigeon. 7. Falcon. 8. Swallow. 9. Pheasant. 10. Partridge.

NUMERICAL ENIGMA.—Be stirring, man, while yet the day is clear.

NINE CONCEALED FRUITS.—Orange, lemon, pear, peach, currant, plum, prune, grape, apple.

Send communications intended for Aunt Sue, to Box 111, *P. O., Brooklyn, N. Y.*, and *not* to 245 Broadway.

Aunt Sue's Chats.

MRS. S. S. D.—A very pretty edging, for the purposes you name, may be made with braid and crochet-work. Get Sutro's feather-edged braid, No. 3 (see fig. 1), (it is sold by the piece of 12 yds., for six cents; proportionally cheaper in larger quantities), Clark's cotton No. 40, and a fine steel crochet-needle. Fasten the cotton into the fourth or fifth loop from the end of the braid (to allow for raveling). Make a chain of six stitches, then put your needle into the next loop but one, with short-crochet. Now make a chain of five stitches, and put your needle through the next loop but one with short-

Fig. 1.—FEATHER-EDGED BRAID.

crochet. Again a chain of five stitches, and your needle through the next loop but one. Now take up the next eight loops of the braid with short-crochet, and you will have reached the point illustrated in the last scallop of figure 2. The eight loops just finished fill up the inside of the lower edge of the scallop. Now make a chain of two stitches and join it in the third stitch (just drawing the thread through) of the lowest chain of five; then a chain of two stitches, and turn back into the second loop (from the eight short-crochet stitches) of the braid; then a chain of two, and back into the third stitch of the next chain of five; a chain of two, and into the next loop but one; then you make a chain of three, and draw your thread through the center of the chain of six; a chain of three, and into the next loop but one. This

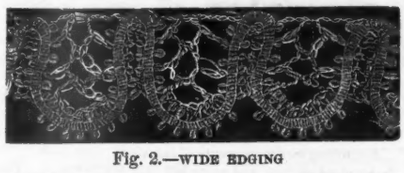


Fig. 2.—WIDE EDGING

completes the scallop. For the commencement of the next scallop (and to join the two) put your crochet-needle through the loop next to the one which is directly underneath the stitch you have on your hook, on the lower side of the braid; turn it over on the wrong side, and double the braid so as to bring the loops (between the two scallops) opposite to each other, then draw your thread through two loops at a time (the two loops which are opposite to each other), leaving the stitches all on the needle, until you come to the loop above the eight short-crochet stitches inside the lower part of the scallop; then draw your thread through the first stitch, on the hook, then through two and through two until you come to the end of your stitches. Now turn it over on the right side, flatten it out, and just at the top of the joining there will be one little loop of the braid standing up by itself; through that you draw your thread and commence another scallop, beginning with the chain of six as before described. The illustrations may enable you to see through what my explanation has left obscure. To make a narrower edging, like figure 3, leave out the second "chain of five stitches"; to make wider edging, increase your chains of five, and take up more loops on the inside of the scallops.

Fig. 3.—NARROW EDGING.

JESSIE W.—You will find a description of toilet-set (pincushion, mats, catch-alls, card-case, hair-pin box, etc.) in the June No., 1876, of the *American Agriculturist*, p. 226.

"W."—The symbolic meaning of precious stones in Germany is:

Amethyst	Control of the passions.
Aqua marine	Misfortune.
Agate	Long life and health.
Bloodstone	Courage and discretion.
Chrysolite	Preservation from folly.
Diamond	Innocence.
Emerald	Happiness.
Garnet	Fidelity to promises.
Opal	Hope.
Ruby	Oblivion and grief.
Sapphire	Repentance.
Sardonyx	Conjugal fidelity.
Topaz	Friendship.
Turquoise	Success.

For the initials "C. L. P.," I can think of nothing better than *coral*, *lapis lazuli*, and *pearl*. It would certainly be a peculiar combination, and "C. L. P." would be very sure that you had the ring made especially for her.

CHARLIE.—Yes; "alligator skins" are tanned, and used for boots and shoes. Nearly 20,000 are tanned yearly (the sides and underneath parts, not the back). They are stripped off, packed in brine, and sent North, from Louisiana and Florida, to be tanned. It takes from six to eight months to prepare them for use. The alligators are sometimes 12, and rarely 15 feet long.

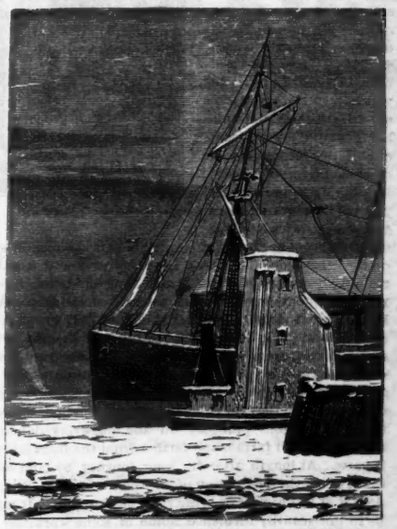
"S. M. F."—An old newspaper, slightly dampened, is the very best thing with which to clean a looking-glass.

"A. M. M.," asks me how to make a "shell-frame." The question is somewhat indefinite, but I suppose she means "how to make a frame of shells." I never had much of a fancy for shell-work, it is so perishable; the shells are always falling off, and getting lost, leaving an ugly gap somewhere. But if I had plenty of pretty shells, and wanted a frame of the kind, I should procure a suitable wooden frame for the purpose: then I should cut a paper the exact size of the frame. On the paper, I should arrange the shells in some tasteful uniform or multiform manner, until it was completely covered. Then I should smear the frame with a strong, stiff glue (a small portion at a time), and transfer the shells from the paper to the frame, one at a time, retaining the position (originally arranged on the paper) as nearly as possible. [Sometimes the frame is covered with a thin layer of putty, and the shells imbedded in that.—ED.]

Thanks for letters, puzzles, etc., to M. Marchand, Charlie F. B., Ida C. C., Augustus J. W., S. G. S., J. R. H., Mary Gold, Sallie, and others, whose favors I hope to answer at some future time.

Where Does the Wheat Go?

Every boy or girl who lives in the grain growing States takes an interest in the wheat crop. They see wheat every where, they hear wheat talked of, and they know that the wheat is sold that sugar, shoes, and many other things may be bought with the money. The girls and the quite young boys, if they take no part in the work of raising the crop, can admire it, and they early learn to know that the fields so bright and green in fall and spring are wheat fields. Later, what a beautiful sight it is, when the tall grain is moved by the summer breezes, and it rolls in waves likes those of the sea! Later still, the green gives way to the rich tint that shows that the grain is ripe, and soon you hear the click of the reapers, and then come the hurry and the buzz of the thrashing time. All these make the wheat crop a most interesting one, even to the young people who can not work at it. But the older boys are sure to have a hand in the crop at some time, if it is only to drive the horses or otherwise help at the thrashing machine. It must be a dull kind of boy who can keep quiet when thrashing is going on, where all is so active and every one is doing something with all his might. The horses are pulling, the drivers shouting—or if an engine is used, the steam puffing—the machine going with a tremendous racket; even the air seems full of chaff, and straw, and shouts, and sounds. Where so much is going on we say—a boy that is any sort of a boy—is sure to catch the spirit, and be doing something. When at the thrashing machine, do you ever think what all this bustle and rush is for—what does this crowd of horses or steam, of cogs and cranks, of men and boys, all this noise and dust—what does it all accomplish? Go to the delivery spout of the machine, and what do you see? A little stream of small yellowish or brownish grains—the wheat running into a bag. But this hurry-skurry of thrashing is only the end of a long line of operations. Months ago there were strong horses at work with plows, harrows, drills, and rollers. There was the farmers anxiety about snow, and freezing, and thawing, he was watching for insects and smut. Then came reapers and binders, and hauling and stacking—all this work running through months, and all that this little stream of wheat might quietly run from the side of this very noisy machine. Is it worth all this trouble and all this labor to get just those grains. What are they—what are they good for that they should be produced at such a cost—that machines and animals, that men with their hands and with their thoughts, should all combine to produce these little grains of wheat. If we were by, we might play the conjurer of the old fairy tale, and say: "If you would see that stream of wheat as it really is, take this magic glass and look through it. This is a wonderful glass; it is called 'The Imagination.' Every boy, and every girl has one, but they do not always know it, and some who do know it and try to use the glass, look through the wrong end and see things as they are not. But look now at the wheat and what do you see in the stream?"—"Steamships and watches. A Senator making a speech and a cook making a pie; fine laces and silks, and gunny bags and ropes; a thief going to prison, a preacher going to his pulpit; books—books, and more books; newspapers and pictures; a microscope and a locomotive, washing machines and sewing machines, such a lot; looms, reapers and—there, take your glass, I am tired—there is too much—there is everything."—Wheat is bread. That "bread is the staff of life," is a saying so true that many persons think it is from the Scriptures. Wheat is the main support of life in all civilized nations, and life shows itself in innumerable forms, a few of which we have supposed our youngster saw by the aid of "The Imagination." It is no improper use of the imagination to see in the wheat those things which but for the wheat could hardly be possible. In writing thus we would show the farmer's boy that in raising wheat, he is doing something more than getting so much a bushel for it. He is helping on the world's progress; he is furnishing food to the muscles and the brains of the world, and these muscles and brains in turn help him with better plows and thrashers, and send him books and papers to nourish his brain in return. We would show him that while we are all engaged in doing the world's work, the farmer's part is one of the most important and honorable. You can see that this little stream of wheat, insignificant though it looks, is really important. Each grain is full of power, quiet now, but capable of being awakened. In a stream of gunpowder, each grain can exert an immense power, but that is exercised suddenly and dangerously—while the power in the grain of wheat, is exerted gradually, it becomes bread, and bread feeds the muscles and the brains, and its final power is shown in the work these do, which (though sometimes turned to evil) is generally for the good of mankind. These precious grains *are* really worth all the trouble, all the hard work, and all the anxious thought through the months between seed time and harvest, until amid all the hurly burly of thrashing, they can run in a stream, quiet, but



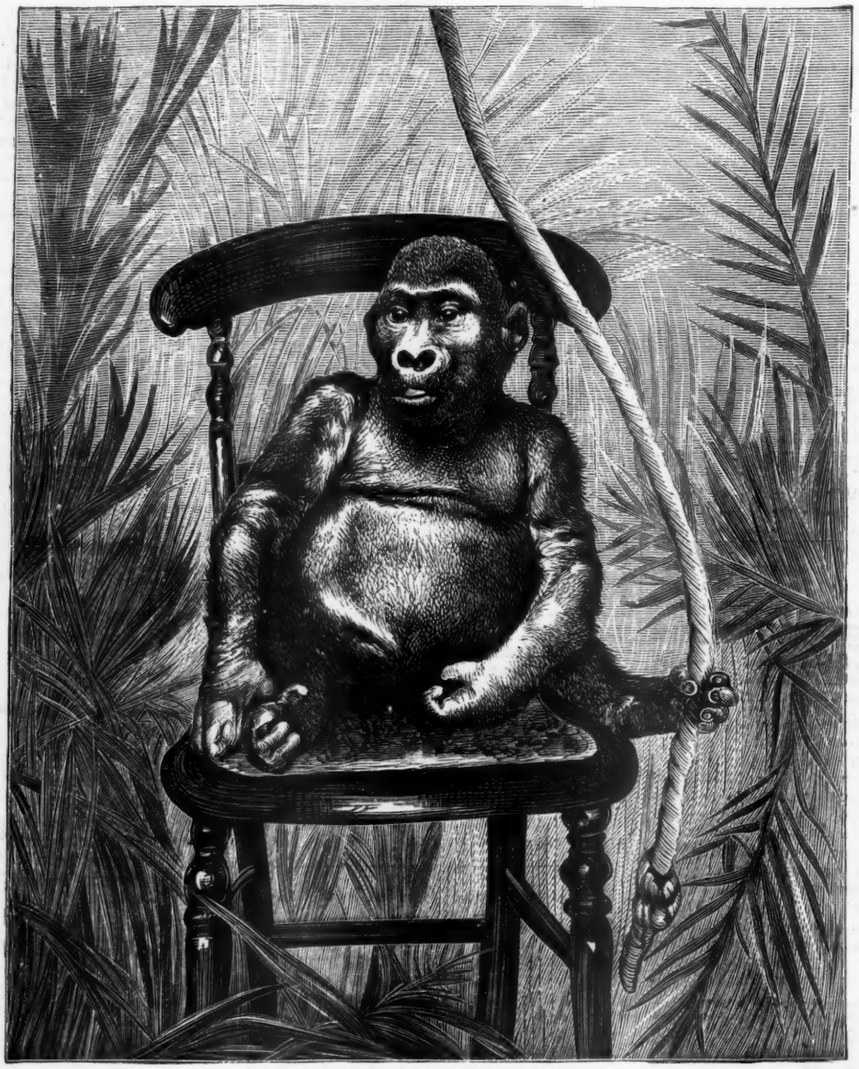
STEAM ELEVATOR FOR LOADING SHIPS.

how full of concealed power, from the outlet of the thrasher. Where does the wheat go then? "To the mill," you will say. That which the farmer sends himself to the mill—even that used in his own neighborhood, is but a small part of his whole crop. The rest finally gets to the mill, but what a long journey much of it takes. Between the field on your farm and the thrashing machine at your barn, to the mill, is often thousands

of miles. If you were to trace the journey of a bushel of wheat from your farm to the table where it is eaten as bread, it might take you a long distance, and through many strange scenes. You see the sacks of wheat loaded upon the wagon, you know that they go to the nearest railroad station, or it may be to a shipping point on the river or lake, and then your knowledge of it ends. The East has been these many years sending its people to the West, and now the West sends its grain Eastward. It comes by railroad and canal, and at last reaches the coast. It may be made into flour in New York, Philadelphia, or Baltimore, and make its last appearance on the table of a Fifth Avenue palace or a Five Points hovel. But most of it must keep moving, and go on and on across the wide Atlantic before it finds a mill. The steamers sailing from New York to Europe on Saturday, a few weeks ago, took 263,000 bushels of wheat on that day, and every Wednesday and Saturday similarly large quantities are taken away. Some of you wheat raising boys can calculate how many farms like yours it will take to make up the quantity taken by the steamers on that one day. These steamers often have to unload and take in their return cargo in three or four days, and you may be sure it is busy times with them; the work goes on day and night, and while the imported cargo is going out at one end, the export cargo goes in at the other end of the enormous ship. As you well know, it would be very slow work to shovel up all this grain and carry it on board in baskets, so steam is called into use. The wheat—possibly some of that from your own farm, is brought to the side of the ship in canal boats or barges, and from there it is loaded upon the steamship by means of a "Steam Elevator." The engraving shows how one of these looks by the side of a ship, and its outside appearance; it is not rare to see two or three of these at work at one steamer. These elevators have an endless band, to which pockets or buckets are attached, and this being moved by a steam engine, a continuous row of pockets, full of wheat, is going up to the highest point of the elevator; there they pass over a wheel, the wheat falls out and a row of empty pockets is going down on the other side. The result is a large stream of wheat, running from the elevator, which may be directed by means of spouts to any part of the hold of the ship. At last the great steamer gets her load, not only of wheat, but of flour, pork, beef, and many other of the products of our farms, even to the eggs from your barn-yard, and starts at the very hour—with all the promptness of a ferry-boat—on her way across the ocean. These grains of wheat, how they must be tossed and rubbed, and as the steamer goes plunging on and on, every day and hour carrying it farther and farther from the farm where it grew. At length after its long journey by land and sea it gets—the destination of all wheat—to mill. Where does it at last appear as bread? Who can tell? It may be in the scantily furnished home of some workman at Manchester, or in the castle of some nobleman; it may be at the table of a London clerk's boarding-house, or possibly at that of the Prince of Wales at Sandingham, or of the Queen herself at Windsor. All, workman, nobleman, clerk, Prince, or Queen, must have bread—they are all equal in this—bread is a universal want, and our fertile farms, our industrious farmers, and you, wide awake industrious boy, as you help whether by working in the field or at the thrashing machine, all are contributing to answer the world's great cry for bread.

A Distinguished Visitor from Africa, P. Ongo, Esq.

Probably there has not been in many years an arrival in Europe which caused so much excitement among a certain class as that of the subject of our sketch. The Emperors, Princes, Mayors, and other high dignitaries, made a great fuss, a while ago, over the visit of the Shah of Persia. More recently our own Ex-President General Grant has received, not only from the officials, but what is much better, from the people in general, a magnificent welcome. But it is doubtful if the arrival of the Eastern Monarch, or a Western Ex-President, was ever viewed with so much interest, as has the arrival of an Individual from Africa, with no title at all, by a few men of science. Monarchs and ex-Presidents were after all but men, while one Individual from Africa was much less than a man, and that very fact made him all the more interesting. Travelers in Africa had long ago given accounts of wonderful creatures who were found there, creatures as large as the largest man, and with strength to do wonderful things, such as crushing a gun-barrel in their teeth, and carrying off the natives in their arms. Later, skulls and skeletons, and stuffed skins of this creature—known as the Gorilla, were sent first to this country, and later to Europe, and these only increased the desire to know more about the animal. It was stated by travelers that the ferocity of these creatures was unbounded, and that even when taken quite young it was impossible to tame them. Several young gorillas were shipped to Europe, but they somehow died, or otherwise disappeared before they reached port, and this was given as additional evidence that the animals could not be tamed. An African captured a very young Gorilla, and sold it to a Portugese gentleman living in Africa, for a small sum. A Prussian Exploring Expedition happening to stop at the village where the Portugese lived, that gentleman gladly gave the young Gorilla to one of the members of the party, who took the animal to Europe, and finally sold it to the managers of the Aquarium at Berlin for $5,000. It then was no longer a mere animal—a young gorrilla, but Mr. Pongo, and under that name his fame extended all over the civilized world. Never was a young Royal Highness more carefully watched than was Pongo. What he did when awake, how he slept, what he had for breakfast, what for dinner, and what he did between meals were closely studied, faithfully recorded, and the intelligence sent all over the world. Berlin had Pongo, and London was Pongo-less, and this would never do; London endured this for two years, and at last sent to Berlin and had the young Gorilla brought over. Once in London poor Pongo had a hard time of it, he was written up in all the daily papers, and pictured in all the illustrated weeklies; the scientific men came and they measured his bones and counted his ribs, they talked about his "facial angle," and his "occipital ridge." At last Pongo went back to Berlin and—soon died. Whether London fog, or London science, was too much for Pongo, we probably shall never know. He went back to Berlin and died very suddenly, and all that is left of him is his many portraits, one of the best of which, from a London journal called "Our Little Folks" is given here. When this picture was taken, Pongo was supposed to be about three-and-a-half years old, he was between three-and-a-half and four feet high, and weighed forty-three pounds. Though covered with hair, and going on all fours, Pongo was looked upon as being more like a human being than any ape or other animal ever before known, but it only needs a look at his portrait, where he naturally uses his foot as a hand, to see that he is very far from a human being, even the lowest and most degraded of which we have any knowledge. He showed considerable intelligence, but not more than is exhibited by some dogs; and though he had been taught to sit at the table and eat very much what his keeper ate, and even to take his food sometimes with a spoon, he showed his natural tastes by preferring to sit upon the floor or to swing upon a trapeze, which was provided for him. Poor Pongo died before he could teach us much about his people—that is, the full-grown gorillas of the African forests.



PORTRAIT OF PONGO—THE YOUNG GORILLA.

According to the accounts of travelers, they grow to be five-and-a-half feet, and some say over six feet high. The skeleton is in many respects more like the human skeleton than that of any other animal; the bones of its limbs are wonderfully large and strong, and while its head is large, that part of the skull which holds the brain is very small. Indeed the brain of the largest gorilla is not half the size of that of the lowest savages yet known. The gorillas are said to go in troops of four females and one male; the two sexes being somewhat different in color, the hair on the males being grayish, and that of the females, blackish. The gorilla is found principally in the western part of Africa, in the forests north and south of the equator. The males are exceedingly savage, and do not hesitate to attack a man if he comes in the way. They are said to come towards their enemy, beating their breasts and roaring terribly, and to be most dangerous. Yet as human-like as gorillas seem in some respects, several of the African tribes eat its flesh, while other tribes will not eat the flesh of this or the chimpanzee or other apes, because they are so much like man. Pongo has proved so interesting, that no doubt other gorillas will be taken from their homes and taught the ways of civilized life, and we hope may not share Pongo's fate.

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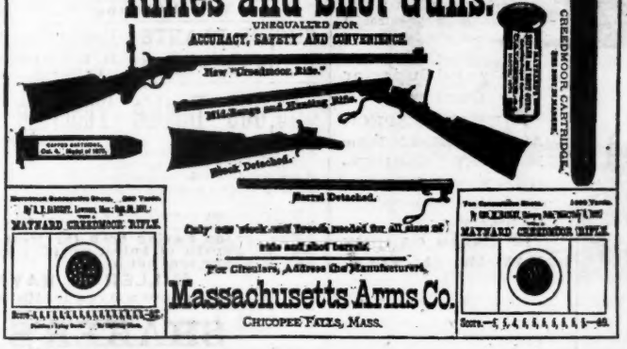

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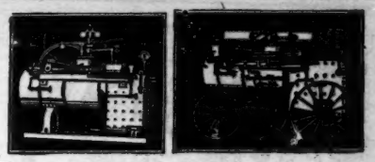

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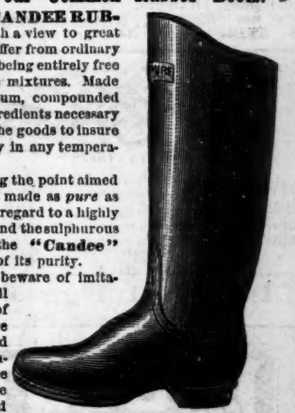

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AMERICAN AGRICULTURIST.

ORANGE JUDD COMPANY, Publishers, 245 Broadway, N. Y.

ANNUAL SUBSCRIPTION **Terms** (always in advance): $1.60 each for single copies: Four copies, $1.20 each: Ten copies, $1.20 each: Twenty copies and upward, $1.10 each. These rates *include Postage*, in each case, which is pre-paid *by the Publishers*. Papers are addressed to each name.

The full Descriptions and Illustrations of the Premiums, with various Notes and Explanations, were published in 8 extra pages of our October number, which can not be repeated for want of space. Any one not having that number, can have one mailed, post-paid, for 10 cents; or a Premium Sheet only, will be mailed to any address without charge.

PREMIUM Explanatory Notes. N. B.

Read and carefully Note the following Items: The Table, on page 401, tells the *name* and *cash price* of each article, and (in last column but one), gives the number of names sent in at the regular price of $1.60 a year that will secure any premium article. (The last column gives the number of names at the lowest club price for 20 or more names, that is $1.10 each, but only a part of the premiums come under this head. Some persons quickly raise large clubs by taking all the names at $1.10 each, and themselves pay the difference, 50 cents each, and even thus get the premium articles very cheaply.)....(*a*) All subscribers sent by one person count, though from several different Post-offices. But....(*b*) Tell us with each name or list of names sent, that it is for a premium....(*c*) *Send the names as fast as obtained*, that the subscribers may begin to receive the paper at once. Any one can have any time desired, up to next July, to complete any list, but every premium desired will be sent as soon as earned and ordered....(*d*) Send the exact money with each list of names, so that there may be no confusion of money accounts....(*e*) Old and new subscribers all count in premium clubs, but a portion at least should be *new* names; it is partly to get these that we offer premiums to canvassers....(*f*) One or two Specimen Numbers, etc., will be supplied free, as *needed* by canvassers, (when 3 cents per copy is furnished to pre-pay postage), but they are expensive, and should be used carefully and economically, and where they will *tell*. Other specimen numbers will be sent, post-paid, *to canvassers only*, for 10 cents each. The price to others is 15 cents....(*g*) Remit money in Checks on New York Banks or Bankers, payable to order of Orange Judd Company, or send Post-office Money Orders. If neither of these is obtainable, Register Money Letters, affixing stamps both for the postage and registry; put in the money and seal the letter in the presence of the Post-master, and take his receipt for it. Money sent in any of the above ways is at *our* risk; otherwise it is not.

☞ Premium Articles for Sale.

It often happens that persons, who have not time to secure these valuable and useful premium articles by raising clubs of subscribers, are desirous of purchasing one or more of them, and wish us to procure or select them. For the accommodation of such, *we will supply and send most of these premiums for cash*, at the prices in the Descriptive List, and prepaid or otherwise, as stated.

Interesting Announcement!

125,000 MICROSCOPES.

Genuine, Well Made, serviceable, highly useful as well as interesting Instruments. A good source of instruction and amusement. Three Fine Lenses and Diaphragm—Stand with Glass Stage, Clips, Glass plates and Cell—Uses Reflected and Transmitted Light, or Opaque and Transparent Objects—Seven Different Powers—Magnifies 6 to 25 Diameters, and 36 to 625 Areas—Conveniently arranged for Practical Use—Not moulded glass, but carefully ground and thoroughly made Lenes.

ONE FOR Every Subscriber TO THE American Agriculturist.

We have a very pleasant announcement to make. It has been customary of late years for many journals to annually present their readers with a Chromo, and this journal has done its part in sending out beautiful pictures that now adorn hundreds of thousands of homes. We have for months been looking earnestly for some *other* Souvenir, some Keepsake, to send to our readers, that would be not only interesting, but really and eminently useful to all, and WE HAVE FOUND IT!

After examining many things, it occurred to us that one of the most desirable, interesting, and *practically useful* things would be some convenient form of the *Microscope*, if a good one could be had within the limits of price, etc. *A Microscope is really valuable to* **Farmers**—*to detect, distinguish, and aid in remedying diseases on plants and animals, whether from insects, decay, or smut, mildew, lice, scab, etc.; to detect adulteration in seeds, and their degree of goodness or badness, the proportion of fertile and infertile seed; also adulteration in fertilizers, ground bone, etc.; to examine wounds and bruises, extract slivers from the hands, etc., etc. The Microscope is equally useful to* **Gardeners,** *Florists, Fruit-growers, etc., for most of the above purposes and for many others.*

To **All Classes,** *the Microscope is useful to detect adulterations in food, as in coffee, tea, spices, sugar, and to examine the texture and defects of many articles.*

As a source of **Instructive Amusement,** *the Microscope is exceedingly valuable to* **Children,** *to* **Young People,** *and to grown people.*

Impressed with the value and desirableness of an instrument which would accomplish the above, we set about examining the various low-priced Microscopes and magnifying glasses to be found here, or imported. Two difficulties were met with. First, the cheap instruments found, were all of poor quality, and lacking some facilities in working; and, second, anything having the perfection of lens and other parts which we could commend, would cost far too much to be introduced into every family. We found no microscope costing less than $2.75 having the principal requisites of one we desired to find—such as triple lenses, stand, adjustability to use reflected and transmitted light, etc., etc.

Next, the query came up: Is it not possible, by means of improved machinery for grinding lenses, and for making each part, and by doing this on a very large scale, to get the desired Microscope at such an exceedingly low cost that every one of our readers could have one?

To this end, we entered into consultation with the

Bausch & Lomb Optical Company, the inventors and manufacturers of the Excelsior and higher grade Microscopes, and of many other optical instruments, who enthusiastically seconded and aided our efforts to the utmost of their skill and ability. A large number of experiments have been made, many forms and combinations of lens and stand, etc., have been constructed, machinery has been devised for rapid and perfect work, and as the result, we have A MOST VALUABLE MICROSCOPE, which we now place before our readers with a satisfaction that is certainly very great to us, and will doubtless be pleasing to *every* reader of this journal.

Description of the Microscope.

The Microscope is shown in the engravings herewith, figure 1 representing it with the lenses separated. The three Lenses (*a*, *b*, *c*, fig. 2) are of superior glass, carefully ground, adjusted to use separately and in combination, and each one is in a polished hard rubber setting. The lens *a* (Fig. 2) magnifies about 6 *diameters* or 36 *areas* or surfaces; *b* magnifies about 8 diameters or 64 areas; *c* magnifies about 10 diameters, or 100 areas; *b* and *c*, used together, magnify about 18 diameters, or 334 areas. The three used together magnify about 25 diameters, or **625 areas.** Used singly, or in combined pairs, and triplet, SEVEN *different magnifying powers are obtained*, of from 6 to 25 diameters, or from 36 to 625 areas. It will thus be seen that by using all three lenses upon a minute object or part of an object, its surface or area will be magnified or expanded **625 times!**

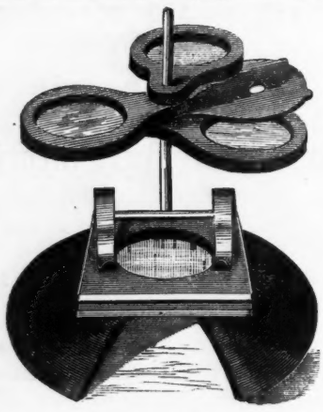

Fig. 1.—MICROSCOPE WITH LENSES SEPARATED.

A Diaphragm, *d*, is used to cut off distortion and render the field of observation distinct. (Full explanations of the use and mode of using each part, with many illustrations, to aid all to the proper management of the instrument, will accompany each microscope sent out.)

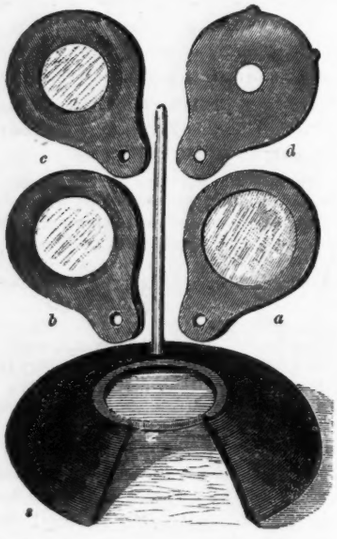

Fig. 2.—STAND—LENSES—DIAPHRAGM.

The *Stand* (fig. 2,) has a base, *s*, of polished hard rubber, with an opening to admit light underneath. In the top of the base is a fixed glass stage, *z*, upon which to place objects to be examined. Two thin plates of glass are provided to lay over this, between which flat objects may be placed. The water-proof *Cell*, with a central aperture, can be placed between the glass plates, forming a cavity for liquids, for small insects, seeds, etc., etc. These plates and cell are held firmly in place by the Metallic Clips or Springs, so that the instrument can be set on the table or held in the hand for opaque objects, or *be held up to the light* when examining transparent or other specimens which are best seen by light passing *through* them. — The whole is inclosed in a neat Case or Box, with cover, for carrying and keeping. (Engravings of the different parts were given last month; and they will be found on the descriptive sheet sent with each Microscope.)

No instrument so well made, so complete and desirable, has hitherto been offered to the general public at so low a price as **$2.50.** With the improvements in mode of manufacture, and the great number contracted for, this instrument will be supplied at retail for *only* **$1.50.**

BUT to every actual subscriber to the American Agriculturist for 1878, one of these Microscopes will be supplied complete for 40 cents above the subscription price, when taken at the office or its delivery provided for. The Publishers pay for the additional cost of manufacture—a large sum in the aggregate.

(The *American Agriculturist* will be sent post-paid from receipt of subscription to the end of 1878. The Microscopes will be delivered as provided below.)

HERE ARE THE TERMS:

One Subscription and *One* Microscope.....$2.00
2 Subscriptions and **2** Microscopes.....$3.80 ($1.90 each.)
3 Subscriptions and **3** Microscopes.....$5.25 ($1.75 each.)
4 Subscriptions and **4** Microscopes.....$6.60 ($1.65 each.)
5 *to* **9** Subscribers and **1** Microscope each.....$1.60 each.
10 *to* **19** Subscribers and a Microscope each....$1.55 each.
20 Subscribers and a Microscope each.....$1.44 each.

Or, in clubs of 20 and upwards, $1.10 for each subscription, and 33⅓c. for each Microscope, (that is, $1 extra for every *three* Microscopes, in all clubs of twenty or more.)

Delivery of the Microscopes.

(*Read all the Following to avoid Mistakes.*)

I. Any Subscriber for 1878, will receive the Microscope on calling or sending for it at the Office, 245 Broadway, without expense, save the small payment of 40 cents above stated, which is only a part of the actual cost of manufacture alone.

II. Whenever there is a club of subscribers at any place, one of their number can be appointed to receive the Microscopes for all, and have them come by express, making the cost of carriage but a few cents each. We will pack them safely without charge, and forward them in any way directed, on receipt of the names for whom they are to be supplied, with the small extra sum for the Microscopes stated above.

III. Until otherwise announced we will undertake to deliver them to any part of the United States, and Upper and Lower Canada, on receipt of 15 cents for each Microscrope, for *payment of carriage.*

IV. Our subscribers in foreign countries, not named above, will need to provide for, and direct how the Microscopes shall be forwarded to them.

Any *Subscriber already on our books for* 1878, can have a Microscope by remitting 40 cents, (adding the 15c. more, if to be sent prepaid.)

N. B.—The Microscope is designed for **all** subscribers on our books for the *American Agriculturist* for all of 1878, no matter from whom received, on the receipt of 40 cents—the Microscopes to be taken at the office; or 55 cents, if to be sent prepaid, except to foreign countries, as named above.

To non-subscribers the Microscopes will invariably be $1.50 each, and cost of delivery if we deliver it.

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Sample to those desiring agencies, $3.

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WHAT IS IT THAT REMOVES THE DIRT?

You may ask all washerwomen and housekeepers, and your answer from nine out of ten will be: "Plenty of elbow grease;" or, in other words, plenty of hard, laborious rubbing on the washboard. And such is the case, for you first have to rub soap upon the cloth, then you have to rub it in to make the dirt soluble. But does that remove it? No; to do that you must first dip it in the water, and then rub it in again to force water through the fabric. That is what removes dirt after being softened by the chemical action of the soap upon it.

The way in which this could be the most economically accomplished is what we have so long and patiently sought after, and at last a principle has been demonstrated that in uniting all the above named, in

THE PRINCIPLE OF THE LITTLE WASHER

is embodied all the essential points. First, we have the desired heat, which expands the fabric and causes it to discharge the dirt. Second, we obtain a powerful suction beneath the clothes, which causes a rapid downward current of water force through and through them, thereby removing the dirt. Third, we use a large body of water, which holds the dirt in solution. Thus we cleanse thoroughly, rinsing the clothes as usual being all that is required to complete the operation.

The Washer is composed of solid galvanized iron, which will not rust or corrode. There are two sizes—the No. 1, or family size, for ordinary household use; and No. 2, or hotel size, suitable for country hotels, boarding-houses, laundries, &c.

OUR METHOD OF HANDLING.

We want agents every where throughout the United States, in every State, county, town, and hamlet. The retail price of No. 1 Washer is $3.50; of No. 2 Washer, $5. But we sell sample machines of No. 1 size at $3; No. 2, or small hotel size, at $4. Canvassers for this Washer can make more money with it than with anything ever before offered to the public. As, for instance, we established two agencies to test the sale of the Washer upon its merits—one in Naugatuck, Conn., and one in Providence, R. I. The former, Mr. Charles Daniels, in a town of about 2,000 inhabitants, sold by canvassing in two weeks eighty-two Washers. In the latter place Mr. James Roberts, now of Naugatuck, Conn., sold in less than three months, without canvassing or advertising outside the store, over 500 Washers. A thing never before heard of.

TO PERSONS OUT OF EMPLOYMENT

we would say, if you want to secure a paying business, now is your time. Don't wait till the best territory is taken up, but send at once for sample machine and go to work. By following instructions you can sell to nearly every family in your neighborhood. Others have done it, and there is no reason why you should not. Full directions and instructions accompany each machine. Also, special terms to agents, circulars, testimonials, &c.

All orders must be accompanied with cash.

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These Microscopes have been perfected under the direction of some of the ablest Microscopists of the United States, and unite stability, firmness, and compactness, with as great simplicity of construction as is compatible with the purpose for which they are intended. The *Objectives* have received the highest praise from every microscopist of note who has examined them. Prices moderate, ranging from $20.00 to $200.00. They are manufactured under the direct superintendence of **Mr. E. GUNDLACH,** formerly of Berlin (whose name is well known among microscopists), by the

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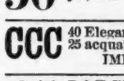

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1 Gravy Ladle (8 in. long), Albata, silver-plated.....75
1 Soup or Oyster Ladle (11 in. long), Albata, silver-plated.....$1.25
(See illustration, which shows style of last two mentioned articles.)

The entire set (50 pieces).....$11.00

Since our former advertisements appeared, we have decided to give the readers of the *American Agriculturist* a higher grade of goods than those heretofore advertised. Not that the others did not give perfect satisfaction, but we feel that the new designs (made expressly for this trade) will, in quality and finish, be more desirable, and well worth the small advance in price.

All sums over $1 should be sent in Registered letter.

Address **STEVENS BROS. & CO.,**
Manufacturers, Northford, Conn.

The

For pamphlet fully explaining the above illustration, address
THE LAMB KNITTING MACHINE CO.,
Chicopee Falls, Mass.

Imperial Egg Food.

(See Advertisement, page 37.)

Take it Easy.

Common-Sense Chairs and Rockers.

My Reading and Writing-Table is separate from chair, and is secured in position by a strong button. Is easily adjusted to nearly all kinds of arm-chairs, but should be used on my No. 4, 5, or 13, to give *complete* satisfaction. Table can be set at any angle desired, or lowered to good position for writing. Makes a nice table for an invalid. Cutting-board for the ladies. None of your little 7x9 affairs; but is 16x32 inches. Cannot be got out of order.

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See that my name is stamped on chair before purchasing. Nothing better or more suitable for

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Capital, $200,000.00. Net Surplus, $189,315.09. Total assets for the security of Policy holders January 1st, 1877, $1,0 0,-622.00. Insures only Farm Property and Residences against fire and lightning. Takes no business risks.

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Make the most of it.

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are *cheap in price, handsome in appearance, accurate in performance,* and *durable in actual service.* They have Detached Lever Escapements, Heavy Metal Movements, and balance wheel like a watch, and consequently run in any position.

The "St. Nicholas," imitation morocco, (4½x4).....$2.00
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Carefully packed and sent by mail, post-paid, on receipt of price.

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Established 1856. **New Haven, Conn.**

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Massey's Revolving Shoe Heel Protector.

Warranted to wear the heel evenly on all sides, maintaining an upright tread to the Foot, and avoiding uneven wear of the Sole and Upper. It doubles the durability of Shoes and Boots, saves expense of reheeling, is *Noiseless,* does not Tire the Foot, and does not Slip. No nail to wear the carpet. Can be attached by any one. Twelve Sizes made suitable for all Shoes and Boots. Samples, with Tool and Directions for applying, sent post-paid, on receipt of 50 cents. Liberal discount to the Trade. N. B.—In ordering, send width of heel for proper size. Address

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The only forged ox-shoe made with *concavity* to fit hoof, and the best and cheapest.

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HORSE CLIPPING MACHINES.

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Are carefully made, and are of such a quality and form as to work with smoothness, thus avoiding altogether the usual irritation attending the shearing of horses.

Orders filled by mail.

Postage, 25 cents extra.

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FOR ALL VARIETIES OF **POULTRY.**

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LAYING HENS, YOUNG CHICKS, DUCKS, and TURKEYS.

WILL MAKE HENS LAY,

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An Encyclopedia of 900 pages, comprising fullest instruction in Hunting, Fishing, Boating, Training and Diseases of Dogs, Woodcraft, Taxidermy, etc., with a Directory to the principal Game Resorts of North America. By CHARLES HALLOCK, Editor of Forest and Stream and Rod and Gun. Price $3. Published by Forest and Stream Publishing Company, 111 Fulton St., New York. Second edition now ready.

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Monthly Journal devoted to Veterinary Science and Veterinary Interest.

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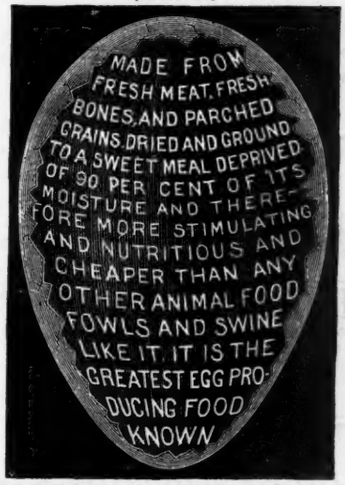
FOR FOWLS AND SWINE.

(PATENTED.)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They excel in **Egg-producing,** are **Non-setters, HARDY,** and **Mature earlier** than any other **breed.** My stock (4 pens) are all **First PREMIUM,** amongst them I have the **NOTED BROWN COCK MAJOR S,** who has taken **several first** and **SPECIAL PREMIUMS.** Birds mated in Pairs or Trios for sale. Eggs $3.00 per 13. **EDWARD LUTZ,**
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Light and Dark Brahmas, Partridge and White Cochins, Brown and White Leghorns, Houdans, and G. S. Bantams. For sale at all seasons, at reasonable prices. Eggs, securely packed in new baskets, $3.00 per 13, or $5.00 for 26. Please state what you want. Send for Circular.

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A well executed Photograph of one of the finest Poultry Houses in the United States, will be sent to any address upon the receipt of 25 cents. H. H. Stoddard, speaking of my building, says, that it is altogether more elegant than anything that has appeared in the Poultry World.

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Hatches and rears the young chicks! Highest possible endorsements!

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Run in any position; keep good time, and give warning when there is **danger of fire.** Sent by mail. Price $5.

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A splended 32 page Illustrated Monthly Magazine devoted to the Breeding and Management of
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SAFETY EGG CARRIER. See Nov. *Agriculturist.* Circulars ready. Address
A. R. SPROUT, Picture Rocks, Lycoming Co., Pa.

TUCKER'S
IMPROVED
Egg Carrier.

The strongest, safest, and best in use, having advantages possessed by no other. **Agents wanted.**

WM. C. BARKER & CO.,
Sole Proprietors and Manufacturers, 189 Market St., Phila., Pa.

Black Bass for stocking ponds—**Pekin Ducks, Bronze & Narragansett Turkeys,** Light Brahmas. **Jersey Cattle,** A. J. C. C. R., and Cotswolds, at low prices. Address W. CLIFT, Mystic Bridge, Ct.

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The only Mill that will grind Corn with Shuck on without extra expense. The only Mill grinding Corn and Cob successfully that will grind Shelled Corn fine enough for family use.

Grinds twice as fast as any other Mill of same size and price.

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This mill is the cheapest, most durable and perfect iron feed mill ever offered. It is simple, easily managed, and can be run by Wind, Steam, Water, or Horse power. The chilled iron plates have grinding surfaces on both sides and can be reversed, thus making one set equal to two on the old plan. An extra set is sent with every machine, and the two sets will grind Four Thousand Bushels of good Feed. New plates can be had for $1.25 per set. These mills are built wholly of iron, (except the Hopper,) are strong, efficient, and durable Thousands are in use on Stock Farms—every one giving excellent satisfaction. Every farmer should have one and grind his own Feed.

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Shells and Grinds Six to Fifteen bushels of Corn per hour. Two to four horse power. Send for Circular. Address

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Grinding parts are STEEL. Grinds all kinds of grain rapidly. Is durable, simple, and cheap. Is suited to all kinds of horse-powers.

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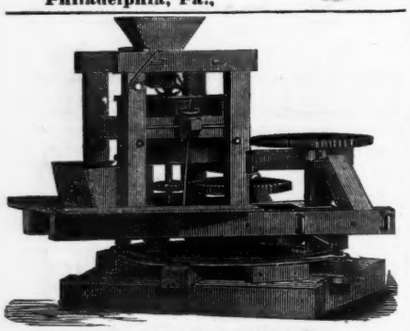

THE LANCASTER
Portable Grist Mill.

Horse-Power and Grist Mill combined.
Friction avoided—Power & Space economized.
A long felt Want Supplied.
Every Farmer his own Miller.

This mill, with twenty inch stones, worked with two or four horses, will grind from three to five bushels of fine meal or flour per hour. It is simple and durable in construction, and can be easily managed by any farm hand. It occupies no more space than is required by any ordinary horse-power.

Price of the combined Mill and Horse-Power, **$250.**

Circulars with full description sent upon application.

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The Birdsell Clover Separator,

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HEEBNER'S HORSE POWER
WITH
PATENT LEVEL TREAD
AND
SPEED REGULATOR.

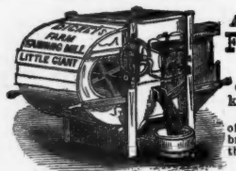
Heebner's Improved Threshing Machines. Send for Illustrated Circulars to

HEEBNER & SONS, Lansdale, Mont. Co., Pa.

Imperial Egg Food.

(See Advertisement, page 37.)

The Best Fanning Mill in the World.



BUY THE
A. P. DICKEY
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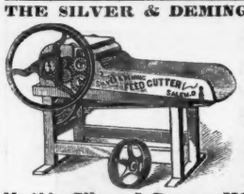
No good Farmer can afford to market dirty grain.

A moderate quality of grain, well cleaned, brings a better price than the nicest grade in dirty condition.

Address **A. P. DICKEY, Racine, Wis.**

THE SILVER & DEMING FEED CUTTER



Has no superior in the market. Celebrated for its great capacity, ease of running, and its adaptability to all kinds of work. Our **"Improved Safety Fly Wheel"** is the only successful device for preventing accidents so common to Power Feed-Cutters. Send for circulars giving prices and full particulars.

Man'd by **Silver & Deming Mfg Co., Salem, Ohio.**
For Sale by
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BALDWIN'S AMERICAN
Feed Cutter.

Easiest running, fastest cutting machine in the market. Cuts all kinds of Feed, Hay, Straw, and Corn Stalks. Superior to any in the market. Send for Circular, containing Description and Price List.

C. PIERPONT & CO.,
Manufacturers, New Haven, Ct.

THE HARVEST OF 1878.

For description of **A Wonderful Improvement in Harvesting Machinery,** see page 400, October number *American Agriculturist.* For further information address Whiteley, Fassler & Kelly; Champion Machine Co., and Warder, Mitchell & Co., of Springfield, O., and The Toronto Reaper and Mower Co., Toronto, Canada.

OTIS BROTHERS & CO.,
348 BROADWAY, NEW YORK,
SOLE EXPORT AGENTS
FOR THE
New Champion Mower,

(FORMERLY KNOWN AS WHITELEY'S CHAMPION HAYMAKER.)

For Editorial Endorsement see *American Agriculturist,* for May, 1877. For testimonials see page 400, October issue, of same publication.

I SELL my Improved **Harrow** directly to **Farmers,** and ship it to any part of the country. Send for circular.
S. HUTCHINSON, Griggsville, Pike County, Ill.

BRADFORD MILL CO.
Successors to Jas. Bradford & Co.
MANUFACTURERS OF
French Buhr Millstones,
Portable Corn & Flour Mills,
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Also, dealers in Bolting Cloths and General Mill Furnishing.
Office & Factory, 158 W. 2d St.
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The best Polishing Powder for Jewelry, Silver Plated Ware, &c. Sent post paid for 25c. Agents wanted. T. E. Reed & Co., New Britain, Conn.

Cotton Seed Huller
AND FEED-MILL COMBINED,

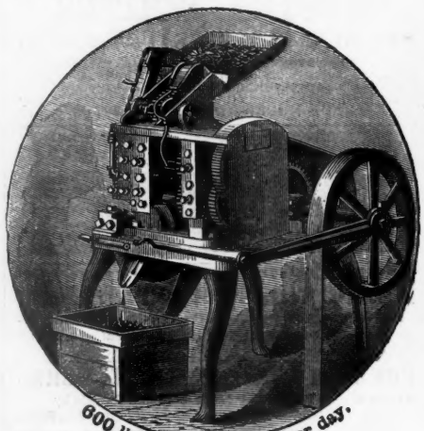
For Plantations and Oil-Mills. Used by Planters, the Oil-Mills in New Orleans and through the country. Send for Circulars and Judges Report. Pay for itself in a few weeks.

D. KAHNWEILER,
120 Centre St., New York.

THE GLOBE NAIL.
THE BEST HORSE SHOE NAIL EVER MADE.

About ten years ago the **GLOBE NAIL COMPANY of Boston,** put on the market the first pointed, polished and finished Horse Shoe Nails ready for driving. Previous to that time all Horse Shoe Nails were pointed, and most of them made, by the shoers in their own shops at the rate of but six pounds per day.

The **Globe Nail** was at once found to be much cheaper and better than any then in use. It soon became so popular that all manufacturers of Horse Shoe Nails were compelled to make their Nails to resemble the Globe. For the last ten years it has been the model. Each year the Nail has been greatly improved in quality, and to such a point have we educated the shoers that now they will hardly use a nail unless it is absolutely perfect.



600 lbs. Finished Nails per day.

At the Centennial Exposition in Philadelphia, we were awarded the Medal and the following report, far stronger than that given upon any other Nail:

INTERNATIONAL EXHIBITION, 1876.
U. S. CENTENNIAL COMMISSION.
[BUREAU OF AWARDS.]

PHILADELPHIA, June 22, 1876.

No. 239, Globe Nail Co., Boston, Mass.:

Horse Shoe Nails, Pointed, Polished and Finished. The uniformity in size, smoothness of finish, hardness and tenacity of the iron, closeness of fibre, and excellence of the head and point, the tensile strength of body, and riveting properties of these Nails, unite in making them of the very highest class of manufacture.

Recommended for an Award of Merit.

DANIEL STEINMETZ, Phila., Chairman,
J. D. IMBODEN, Richmond, Va.,
CHARLES STAPLES, Portland, Me.,
G. L. REED, Clearfield, Pa.,
DAV. McHARDY, Aberdeen, Scotland,
T. DIEFENBACH, Germany,
} Group Judges XV.

We annex a sample of the testimonials we receive daily from all parts of the country:

ST. LOUIS, MO., June 8, 1877.

GLOBE NAIL CO., BOSTON, MASS.

Gentlemen: Find enclosed advertisement and postal card concerning your Nail. [Referring to a scurrilous advertisement and postal card, disparaging the Globe Nail, circulated by a rival manufacturer over the humbug signature of "Humane Society for the Prevention of Cruelty to Animals." No Society bearing that title ever existed.] As I take a great interest in the prevention of cruelty to animals, —horses in particular,—I desire to say a few words in favor of **The Globe Nail.** Though I am not a very extensive Horse Shoer, yet I have used enough Nails of the different makes to speak knowingly. I have used the Globe Nail in my shop and on the race track for six years, on all classes of horses, from the heavy draft horse to the tender footed running horse; and I can safely say **it has no superior in point of Toughness, Shape, and Finish, if it has any equal.** I have used about fifteen hundred pounds of Globe Nails a year for the last six years, and in that time I have found four imperfect Nails, two of which I returned to you about two years ago and received in return four perfect ones, for which accept my thanks. If my men had no better sense than to drive those imperfect Nails in a horse's foot, I would not consider it the fault of the Nail if the horse was lamed. If bosses would look more to the competency of their men and less to trying to get shoeing nails a few cents a pound cheaper, we would have fewer lame horses. **I know for safety and durability, with a man who understands his business to drive them, your Nails can't be beat.** I am willing to pay, without any suit, for all horses that are lamed in my shop by using the Globe Nail. As long as it is made as at present, I shall continue to use it, even if I could get other Nails for nothing. I consider it the safest Nail that was ever driven in a horse's foot.

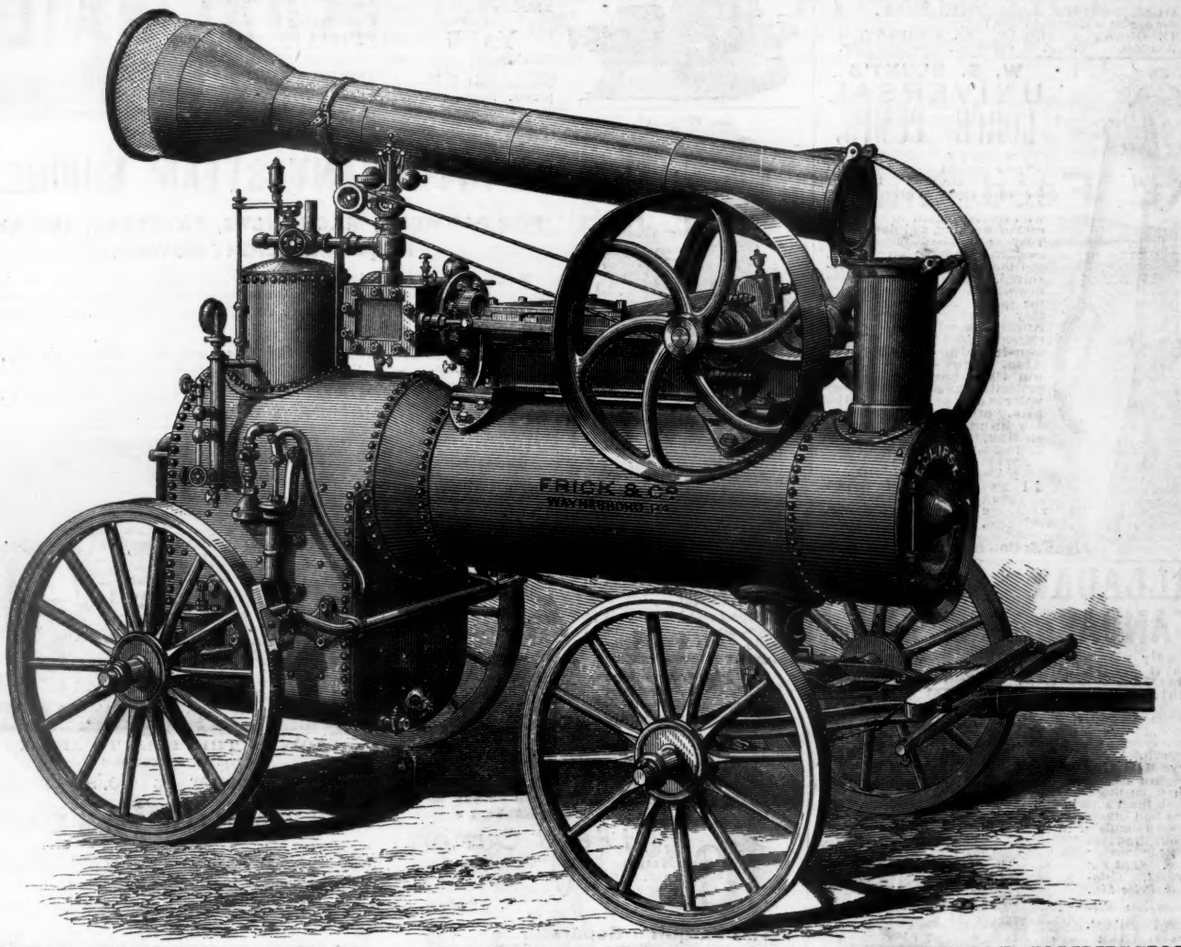
Yours Very Respectfully,
(Signed.) P. H. O'NEILL,
Horse Shoer, No. 1007 Broadway.

P. S.—I think I could get every boss in St. Louis to sign this if I thought it necessary. P. H. O'N.

The best Horse is sure to win. SO CLEAR THE TRACK FOR THE

GLOBE NAIL CO.

"ECLIPSE" FARM ENGINE.



HIGHEST CENTENNIAL AWARD and SPECIAL MENTION by the U. S. CENTENNIAL COMMISSION.

A MEDAL AND TWO DIPLOMAS.

INTERNATIONAL EXHIBITION, PHILADELPHIA, 1876. No. 235.

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith:

Philadelphia, January 31st, 1877.

REPORT ON AWARDS.

Product, *Portable Farm Engine.* ("*Eclipse.*")

Name and address of Exhibitor, *Frick & Company, Waynesboro, Pa.*

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award, for the following reasons, viz.:

This engine gives the best results of any that were tested, and may be regarded as a well-made, strong, and useful machine. The traveling wheels are large and powerful. The boiler is suspended on springs for traveling, which are let down when at work. The boiler is capacious. There is a powerful brake on the hind wheels, very useful for staying the engine when at work. The engine is carried on the top of the boiler, resting on a powerful bed-plate, which is hollowed out to form a receptacle for oil leakage. This can be detached from the brackets, and the engine converted into a fixed horizontal engine if required. The governor has three speeds, and the crank shaft is counterbalanced. The engine saddle has provision for varying expansion. The water heater is large, of the ordinary diaphragm form, and the pump with air chamber is well constructed. The cylinder has balanced slide valve. The safety valve works by a spring, which is a good arrangement, particularly when the roads are rough. Driving wheel on each side of crank shaft.

GEORGE E. WARING, Jr.,
Signature of the Judge.

APPROVAL OF GROUP JUDGES.

FERMIN ROSILLO. *E. OLDENDORF.* *JAMES BRUCE.* *EKEDA KENZO.* *JAMES S. GRINNELL.*

A true copy of the record.

FRANCIS A. WALKER,
Chief of the Bureau of Awards.

[SEAL.]

Given by authority of the United States Centennial Commission.

J. L. CAMPBELL, **Secretary.** *A. T. GOSHORN,* **Director-General.** *J. R. HAWLEY,* **President.**

Other Awards of First Premiums and Prize Medals to the

"ECLIPSE" FARM ENGINE,

Cincinnati Industrial Exhibition, 1874; Maryland State Fair, Baltimore, 1874; Virginia State Fair, Richmond, 1874; North Carolina State Fair, Raleigh, 1875; Delaware State Fair, Middletown, 1875; Pennsylvania State Fair, Lancaster, 1875; North Carolina State Fair, Raleigh, 1876; Georgia State Fair, Atlanta, 1877; Maryland State Fair, Westminster, 1877; also numerous County Fairs, and wherever else exhibited.

MANUFACTURED ONLY BY

FRICK & CO., WAYNESBORO, PA., U. S. A.

70 MILES WEST OF BALTIMORE, ON WESTERN MARYLAND R. R.

ALSO, MANUFACTURERS OF

STATIONARY ENGINES and BOILERS, CIRCULAR SAW MILLS, Etc,

For Particulars of the Above Send for Illustrated Catalogue.

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Secured by letters patent.

These pumps have enormous power, and are for the house or for **out-door wells** of any depth. They are constructed with special regard to strength, ease of working, and durability. They can be immediately changed from lift to force pumps, and the air chamber can be revolved, so as to allow the handle to work at any desired angle with the spout. Having close tops, they cannot be tampered with. Attention is called to our new elegant pattern **DEEP WELL non-freezing FIRE PUMP. Also, Blunt's Sand Vacuum Chambers.**—A complete protection against sand or gritty water in **dug or driven wells, pits, mines, and rivers.** For **hand or steam pumps,** all sizes, from 1¼-inch to 4-inch suction pipe.

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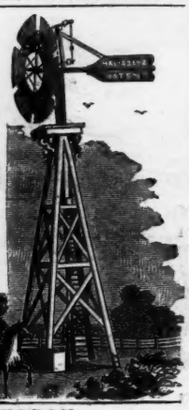
HALLADAY STANDARD.



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Every Mill Guaranteed as above.

Each piece fitted and numbered at the Factory, so that farmers and others can erect their own mills if desired, using our drawings and instructions for a guide. *Send for Illustrated Catalogue & Price List.*

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For Wells and Cisterns.
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NONPAREIL
FARM & FEED MILLS,
Bone, Drug, and Spice Mills. 10 sizes, for Hand or Power. Conical French Burr Stone Flouring and Corn Mills.
☞ Were awarded highest Medal and Diploma at Centennial Exposition.
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THIS patent portable Mulay Saw Mill is adapted to any locality, will saw any kind of logs, and will do as much work (power and hands being considered) as the best Circular Mills. Its frame, head-blocks, and working parts are of the most substantial and permanent kind, being made entirely of iron and steel. It is usually set up and started in from one to two days time. It is generally driven by threshing engines of not exceeding ten horse power. It cuts from 2000 to 4000 feet of inch lumber per day. The Mill and Engine may conveniently be operated by two men. Send for circular.

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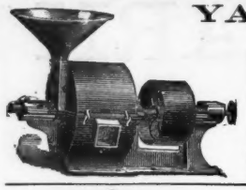
POULTRY, GAME, BUTTER, &c., &c.
Also Agents for Hornby's Steam-cooked Wheat and Oats.
No. 279 Washington-st., N. Y.
(Est'd 1845.) Ref., *Irving National Bank*, New York City.



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Builders of the **Yale Vertical,** the *best* and most *economical,* either for land or marine use; also **Horizontals,** with or without the *Rider* Cut-off.
Rubber and Punching Presses.

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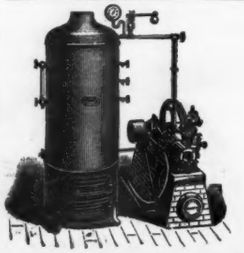
Iron Frame; French Burr; Self-Oiling; Self-feeding; Adjustable-Balanced; Long Bearings, *Cheapest,* best arranged, best finished, and for quality and quantity ground no superior. Send for circular.



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LITTLE GIANT STEAM ENGINE.

FOR FARMERS, MACHINISTS, PRINTERS, AND ALL REQUIRING LIGHT POWER.

Sizes from One to Six Horse Power. Prices for Engine and Boiler Complete, from $150 to $450. We make the *Strongest Boiler* and the *Best Engine* in the country. Call at our Factory and examine, or send for free Illustrated and Descriptive Catalogue.

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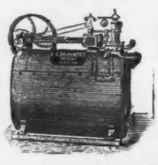

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2½ to 10 H. P.
Made by Special tools.
All parts duplicated.
Send for circular.
SKINNER & WOOD,
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STEAM ENGINES,

A. B. FARQUHAR, York, Pa.,

Cheapest and best for all purposes—simple, strong, and durable. Also *Traction Engines* for common roads.

SAW, GRIST AND RICE MILLS, GINS, PRESSES AND MACHINERY generally. Inquiries promptly answered.

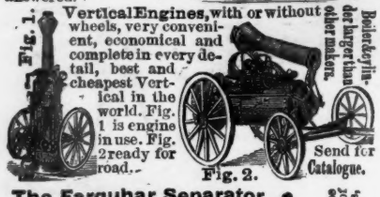

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Fig. 2.

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Penna. Agricultural Works, York, Pa. Lightest draft, most durable, simplest, most economical and perfect in use. Wastes no grain, cleans it ready for market.

Steam Engines, Horse Powers and Tools, all kinds. Also, Ploughs, Cultivators, &c., &c.

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This water-proof material, resembling fine leather, is for outside work (*no tar substances used*) and inside, instead of plaster. Felt carpetings, etc. Send for circular and samples.

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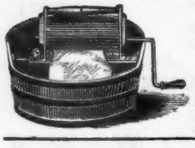

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They are a Perfect Success. Simple, Durable, and Cheap.

Agents wanted in every town where they are not already being sold. Retail price $8. Send for circular. Address
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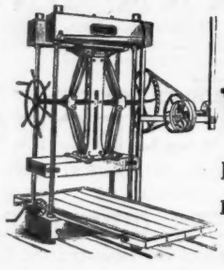

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Cider and Wine Press
WITH
Double Platform.

BOOMER & BOSCHERT PRESS CO.,
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Imperial Egg Food.

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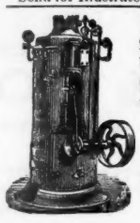

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